Nebraska GIS Steering Committee

Building a Spatial Data Infrastructure for Nebraska – December 2001

Coordinating the Implementation of GIS Technology at the State and Local Government Level

— An Annual Report and Strategic Plan Update

NEBRASKA GEOGRAPHIC INFORMATION SYSTEMS
STEERING COMMITTEE

BUILDING A SPATIAL DATA INFRASTRUCTURE FOR NEBRASKA

An Annual Report and Strategic Plan Update

December 2001

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Building a Spatial Data Infrastructure for Nebraska – December 2001

¾ An Executive Summary ¾

National Events and Spatial Data Infrastructure. Several national events or initiatives occurred in 2001 that served to highlight the importance of spatial data and the collaboration necessary to build a common spatial data infrastructure for Nebraska and the nation. Unfortunately, the most dramatic of these was the September 11th terrorist attack. Among the Homeland Security responses to these attacks was an effort to quickly compile available geospatial data, from a wide variety of sources, to aid in assessing vulnerabilities and to plan prevention and response capabilities. In response to this heightened interest in GIS among the emergency planning and response agencies, the GIS Steering Committee has adopted a new strategic goal to assist these agencies in their use of GIS and geospatial data.

Prior to the September 11th attacks, a joint initiative by the U.S. Office of Management and Budget and the Federal Geographic Data Committee sought Nebraska GIS Steering Committee's leadership in a spatial data infrastructure initiative. The concept behind this Implementation-Team (I-Team) Plan is to engage state, federal, local and private entities in collaborative process to develop and maintain widely needed geospatial data and the institutions needed to access and distribute that spatial data.

Follow-up on 2000 GIS Strategic Plan. The spatial data infrastructure focus of these national initiatives closely paralleled the focus of a Nebraska GIS Strategic Plan, "Building a Spatial Data Infrastructure for Nebraska – September 2000", which was outlined in the Nebraska GIS Steering Committee's 2000 Annual Report. This year's Annual Report is organized around providing an update on the goals, objectives and projects outlined in the 2000 Annual Report and Strategic Plan.

Strategic Direction. The strategic focus of the GIS Steering Committee's efforts over the last year was reflective of its mission statement and the six long-range goals adopted as part of its 2000 Strategic Plan. The Steering Committee mission statement reads as follows:

> *The mission of the Nebraska Geographic Information System Steering Committee is to encourage the appropriate utilization of GIS technology and to assist organizations to make public investments in GIS technology and geospatial data in an effective, efficient, and coordinated manner.*

This Annual Report provides an update on the status of each of the six long-range goals and the related activities that have occurred over the last year. Some of those activities are summarized below.

Priority Geospatial Data Development. A pilot project was completed to develop a standardized, high-resolution database of surface water features for one of Nebraska's watershed areas. Based on the successful pilot, intergovernmental planning has been initiated with the goal of developing this standardized hydrographic database statewide. Two additional watershed projects have been organized using a mix of interagency funding and in-house capabilities.

The Department of Natural Resources has completed the second year of a three-year cooperative agreement to develop revised, statewide digital surface elevation data and digital ortho-imagery.

The Department of Roads has completed an agency-wide strategic planning process and has completed over half of its efforts to develop a comprehensive statewide transportation database by bringing approximately 60,000 miles of local roads into its GIS database.

The Department of Roads has also stepped up to fill a geospatial data void by making a commitment to develop and maintain a relatively current database of municipal boundaries.

In an agricultural state like Nebraska, soils data is needed for a wide range of applications. Three agencies (USDA-Natural Resources Conservation Service, Conservation and Survey Division-UNL, and the Nebraska Department of Natural Resources) have complete the fourth year of a five-year effort to convert county soil surveys into a standardized digital geospatial product**.**

Non-Data Spatial Infrastructure Initiatives. Land record modernization is another of the priority long-term strategic goals of the Steering Committee. One the biggest hurdles that this initiative must overcome is the lack of a policy consensus around structures for how state, local, regional and federal entities might cooperate to sustain such an effort. This past year, the Steering Committee has worked with several of the key agencies and constituencies to outline a project charter for a Land Record Modernization Study that would include a process designed to define such a consensus approach. At the time of this report, the Steering Committee was anticipating funding for this study from the US Geological Survey.

Keeping up with advances in GIS technology is one of the challenges for current and new users of GIS. In keeping with its long-term goals of providing technical assistance and to facilitate data sharing, an Interactive Internet Mapping Advisory Committee has made some recommendations for how agencies might cooperatively use this new technology to interactively share geospatial data over the Internet.

Another long-term goal is education and outreach. The Steering Committee provided assistance in organizing the 2001 Nebraska GIS Symposium, a very successful educational effort for 2001. Approximately 300 participants attended this 3-½ day Lincoln event that included 36 educational sessions.

To better equip itself to provide the overall coordination needed to "Build a Spatial Data Infrastructure for Nebraska", the GIS Steering Committee has set, as another long-term goal, the strengthening of its coordination capacity. In 2001, the Steering Committee took the lead in organizing intergovernmental efforts to secure funding from the NITC for two collaborative spatial data infrastructure projects. The Steering Committee, as part of its Implementation-Team (I-Team) planning process, convened a meeting of representatives of federal agencies who use or develop Nebraska-related geospatial data. At this September meeting, 18 federal agencies shared their geospatial data needs and plans. Plans were also laid for on-going, semi-annual I-Team meeting to provide a broader base for I-Team planning.

Building a Spatial Data Infrastructure for Nebraska ¾ December 2001

An Annual Report and Strategic Plan Update

Nebraska GIS Steering Committee

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Nebraska Geographic Information Systems Steering Committee

INTRODUCTION

The Geographic Information System Steering Committee was established by the Legislature in 1991 *(Reissued Revised Statutes of Nebraska, 1943, §81-2601 through §81-2605),* in an effort to coordinate the implementation of GIS technology by state and local governments in Nebraska. Geographic Information System (GIS) is a powerful information technology that has numerous applications in both the public and private sectors. The Steering Committee's role is to see that public investment in GIS technology is achieved in a coordinated, efficient manner.

The GIS Steering Committee is an intergovernmental coordinating body with representatives from state, local, regional and federal public entities. The Steering Committee's work is supported by a Coordinator provided through the Information Management Services Division of the Nebraska Department of Administrative Services.

As required by statute, the GIS Steering Committee produces an Annual Report that is submitted to the Governor, the Clerk of the Legislature, the Nebraska Intergovernmental Data Communications Advisory Council, and Nebraska's Chief Information Officer.

REPORT BACKGROUND

Geographic information is a significant subset of the information explosion that has occurred over the last two decades. In the broadest sense, geographic information is information that includes a spatial reference (street address, latitude/longitude, section/township) as part of the data and is generically referred to as *geospatial or spatial data*.

The geographic component of information has become increasingly important as information technologies, such as Geographic Information Systems (GIS), have been developed to analyze and display information based on its location. Location or place is an important aspect of most data collected and used by public agencies. GIS was initially developed primarily for use in the area of natural resources management. However, as the software's capabilities and the understanding of the technology has grown, the use of GIS has now expanded to include a wide and rapidly growing range of applications (assessment, economic development, transportation planning, public safety, emergency response, etc.). Because of the powerful capabilities of GIS and other geospatial technologies, many public agencies (state, local and federal) are making investments in the technology and more will do so in the future.

What is Spatial Data Infrastructure? Many GIS experts suggest that 70 to 80% of GIS implementation costs are commonly related to geospatial data development or acquisition. Fortunately, one of the more powerful features of GIS is its capability to facilitate the sharing and integration of data from a wide variety of data themes and sources. Past experience has taught public agencies the importance of coordination in making investments in information technology infrastructure. Public agencies have learned that through coordination they can aggregate demand and avoid the costly development of duplicate, non-compatible, computer and communication networks. As our understanding of GIS technology costs and requirements has matured, there is also a growing appreciation of the importance of coordination in the development of a common *spatial data infrastructure*, as a way to avoid the costly development of duplicate, non-compatible spatial data.

To take maximum advantage of the GIS capability to share and integrate data, and to secure the maximum return from public investments in geospatial data, it is important that public investments in geospatial data are coordinated across all levels and types of public agencies. State coordinating bodies, like the Nebraska GIS Steering Committee, are evolving to play a pivotal role in a loosely coordinated state, federal and local effort to build a common *National Spatial Data Infrastructure (NSDI).* The purpose of this plan is to identify those key components and initiatives that are critical to the pursuit of a coordinated GIS development strategy and the development a common *Spatial Data Infrastructure for Nebraska.*

In an effort to facilitate the development of a common NSDI for Nebraska, the Nebraska GIS Steering Committee undertook a strategic planning process in 2000. The results of this strategic planning process were outlined in the Steering Committee's Annual Report for 2000, "Building a Spatial Data Infrastructure for Nebraska – September 2000."

NSDI and National Events. Since the 2000 Strategic Plan and Annual Report was initially published, two national events and/or initiatives have served to increase the importance and priority of coordinated NSDI development. In the spring and summer of 2001, the US Office of Management and Budget (OMB) and the Federal Geographic Data Committee (FGDC) jointly approached state GIS coordinating bodies and asked for their support and leadership in a process known as Implementation-Teams (I-Teams). The goal of this I-Team process is to develop detailed, state-by-state plans for the coordinated development of the NSDI through a process involving federal, state, and local agencies and private entities. Because this I-Team effort so closely parallels the GIS Steering Committee's overall approach, the Steering Committee has indicated its willingness to undertake the I-Team leadership for Nebraska.

The Homeland Security initiatives, which were launched in the wake of the September 11th terrorist attacks, have also served to increase the importance of coordinated NSDI development, as a means to assure that accurate and current geospatial data is readily available when needed. In response to the September 11th events, the GIS Steering Committee worked with the Nebraska Emergency Management Agency (NEMA) to identify what geospatial data was available and how it was best accessed. The Steering Committee has also defined a new long-term goal/initiative to assist NEMA and other public safety agencies in their utilization of GIS.

The 2000 Strategic Plan and Annual Report outlined several areas of priority goals and/or initiatives and suggested objectives or projects that would contribute to the development of a Nebraska NSDI. This follow-up report provides an overview of the NSDI-related activities that have occurred since the 2000 Annual Report and how they related to the goals outlined in 2000.

STRATEGIC DIRECTION

In the 2000 Strategic Plan and Annual Report, the Nebraska GIS Steering Committee outlined its mission statement and six long-range goals or strategic initiatives that would serve as guides in Building a Spatial Data Infrastructure for Nebraska. In aftermath of the September 11th terrorist attacks, the Steering Committee has added one new strategic initiative related to assisting in the application of GIS technology to Homeland Security initiatives.

NEBRASKA GIS STEERING COMMITTEE MISSION

The Nebraska GIS Steering Committee has defined a mission statement to serve as a guide for the its work.

The mission of the Nebraska Geographic Information System Steering Committee is to encourage the appropriate utilization of GIS technology and to assist organizations to make public investments in GIS technology and geospatial data in an effective, efficient, and coordinated manner.

LONG-RANGE GOALS AND/OR STRATEGIC INITIATIVES

Within the context of the Steering Committee's mission statement and its 2000 strategic planning process, the GIS Steering Committee updated and revised its long-term goals for coordinated GIS development. More recently, it also added an initiative on GIS and Homeland Security.

GIS and Homeland Security*. Continue to assist, as requested, the Nebraska Emergency Management Agency and other emergency and public safety agencies in planning for short and long-term GIS and geospatial data requirements to support Homeland Security and other public safety initiatives.*

Timely, accurate information, easily accessed and capable of being shared across federal, state, and local political jurisdictions is fundamental to the decision making capability of those tasked with the homeland security mission. It is estimated that geographic location is a key component of approximately 80-90% of all government data. Geospatial information technology utilizes the locational component of data to provide the capability to quickly visualize activity patterns, map locations, and understand the multi-layered geospatial context of emergency situations.

The GIS Steering Committee has long seen the tremendous potential of GIS technology for emergency preparedness and response applications. In the aftermath of the September 11th attacks, it has become clearer that in emergency situations of whatever origin, our nation and/or state is dependent on rapid access to and application of many types of current, accurate geospatial information. Given the nature of the geospatial data needed for these applications, it is also clear that interagency collaboration and coordination are keys to realizing that potential.

Priority Database Development*. Coordinate the development of widely-needed digital geospatial databases in a standard reference format and establish systems for the on-going cooperative maintenance and enhancement of these priority geospatial databases.*

A core subset of geospatial databases (roads, streams, governmental boundaries, aerial photography, etc.) are needed by a wide range of state, local and federal government agencies

and private entities. The cooperative development and maintenance of these core databases is the most cost-effective means of providing these databases. These core databases also provide the framework for the development of numerous other geospatial databases. The cooperative development of standardized framework databases will minimized costly duplication of effort, facilitate data sharing and minimize costly data integration problems due to incompatible data.

Land Records Modernization. *Promote and facilitate local government land record modernization and GIS development.*

One of the most promising and cost-effective application areas of GIS technology is the modernization of how local government land records are maintained and accessed. In addition to land record modernization, there are numerous other potential local government applications of GIS technology (emergency response, public health and safety, zoning, taxation, street and utility maintenance, etc.) The land record information maintained by local governments is also one of the framework geospatial databases that are needed by a wide variety of state, local and federal agencies and private entities. It is in the interest of the broader GIS community that this land record information be developed in a standardized geospatial format that is accessible to multiple users at the local, state and federal level. Because of the limited resources at the local government level, partnerships will be necessary in many areas to facilitate the development and maintenance of this data.

Technical Assistance*. Provide technical assistance to local governments and state agencies.*

With the growing interest in GIS technology, it is no longer just being used by a limited number of fairly large public agencies. It is becoming a powerful mainstream information technology, with a wide variety of state and local level agencies either developing or having an interest in developing GIS applications. With this growing interest in the technology, there is a parallel growing need for technical assistance to help these agencies develop their GIS/geospatial data or applications. These technical assistance needs range from guidance in designing and planning the development of an in-house capability; to specialized GIS application development; to large-scale geospatial data development projects; to on-going development and maintenance of specific GIS applications. Up to this point, the primary operational model in Nebraska has been for each agency or local government to develop and maintain its own in-house GIS capability. With more and more agencies expressing interest in the technology, it is time to consider the merits and efficiencies that might be gained by arrangements to aggregate the demand and resources available to support these technical services.

Education/Outreach. *Promote an educational outreach program designed to maximize the overall return on public investments in the development of geographically referenced databases and GIS systems by providing educational materials, presentations and coordination services to the public officials and technical staff who will be making these investment decisions.*

While GIS can no longer be considered a new technology, it is still new and relatively complex for many of the agencies and policy makers who are now considering their initial public investments in the technology. Without education and/or technical assistance these public sector decision-makers can easily make costly mistakes in their initial GIS investment decisions. The risks of costly mistakes have less to do with the hardware and software, and more with data purchase or development decisions. Public investments in a GIS educational/outreach program, directed toward government decision-makers, will increase the probability of wise public

investment decisions in GIS technology. Such an education program will increase the likelihood that costly geospatial databases developed for one area and application will not only work as intended for that application, but also for other areas and applications. Such an education/outreach program is a vital component of a coordinated GIS development effort.

Data Sharing and Distribution. *Develop structures, standards, and processes that facilitate easy access to, integration, and usability of publicly available geospatial data.*

A key component of any coordinated GIS development strategy must be the development and maintenance of mechanisms to facilitate the sharing of commonly needed geospatial data. There are several essential elements to such a data sharing strategy. These include the easy ability to discover the existence of data and how it is accessed. The documentation of the data to facilitate its proper use is another essential element, as is the establishment and wide implementation of data standards to facilitate data integration. Geospatial data users and types of data are diverse and data sharing strategies must address this diversity of users and needed data (natural resources, demographics, land records, transportation, utilities, city/regional/state/federal, etc.).

Strengthen Coordination Capacity. *Strengthen the GIS Steering Committee's capacity to facilitate the implementation of priority geospatial database development decisions, data sharing, interagency/intergovernmental partnerships, and agencies' utilization of GIS technology.*

While Nebraska statutes define broad areas of responsibilities for the Nebraska GIS Steering Committee, the Committee has very little in the way of independent authority and/or resources to seriously address those responsibilities. With limited authority and no operational capability or budget, Steering Committee decisions and priorities can only be implemented through the sponsorship and active support of independent state, local or federal agencies. The coordination of GIS development for the overall good of the broad and growing Nebraska GIS user community is a unique and challenging mission not specifically shared by any other public entity. In some specific instances other agencies' missions and priorities are congruent with those of the Steering Committee, and in those cases those agencies may take the lead on a project on behalf of the Steering Committee. However, where this parallel sense of priorities does not exist, the Steering Committee is seriously limited in its ability to implement its priorities. Many of today's major geospatial data development efforts are only feasible through intergovernmental partnerships. The Steering Committee's structure is poorly suited to facilitating the actual implementation of those partnership projects. The availability of seed funding specifically dedicated to collaborative GIS development efforts and the ready access to institutional channels whereby the resources from intergovernmental partners could be efficiently combined and leveraged would enhance the Steering Committee's ability implement collaborative GIS development projects.

HOMELAND SECURITY AND PUBLIC SAFETY

The terrorist attacks of September 11th and the homeland security and public safety initiatives and responses that followed have given new impetus and a higher sense of priority to efforts to leverage the powerful capabilities of GIS technology for emergency preparedness and response. In light of these events, the GIS Steering Committee has chosen to add an additional long-range goal/initiative to those initial adopted as part of the 2000 GIS Strategic Plan.

GIS AND HOMELAND SECURITY*. Continue to assist, as requested, the Nebraska Emergency Management Agency and other emergency and public safety agencies in planning for short and long-term GIS and geospatial data requirements to support Homeland Security and other public safety initiatives.*

Why it is a Priority. Timely, accurate information, easily accessed and capable of being shared across federal, state, and local political jurisdictions is fundamental to the decision making capability of those tasked with the homeland security mission. It is estimated that geographic location is a key component of approximately 80-90% of all government data. Geospatial information technology utilizes the locational component of data to provide the capability to quickly visualize activity patterns, map locations, and understand the multi-layered geospatial context of emergency situations.

The potential applications of the GIS technology to emergency preparedness and response have been clear for some time. In the aftermath of the September 11th attacks, it has become even clearer that in emergency situations of whatever origin, our nation and/or state is dependent on rapid access to and application of many types of current, accurate geospatial information. Among the critically needed information is the following:

- Facilities and operations susceptible to attack.
- Critical infrastructure, including telecommunications; electrical power systems; gas and oil production, storage and distribution; banking and finance; water supply systems; emergency services.
- Accurate employment data tied to specific locations.
- Detailed and current "framework" data, including orthophotography, transportation, elevation, political boundaries, property ownership, hydrography and geodetic control.

GIS technology is capable of quickly rendering one to several layers of digital geospatial data into map-like products. These systems can facilitate near-real time performance of a wide range of relevant geospatial analyses. These characteristics make geographic information technologies, combined with appropriate sets of geospatial information, an invaluable tool for the handling, display, and analysis of information involved in every aspect of Homeland Security.

Current Status. At the time of the September 11th attacks, the Nebraska Emergency Management Agency (NEMA) had very limited GIS capabilities. In the aftermath of September 11th, NEMA indicated its interest in rapidly developing GIS capability. The initial NEMA focus was on conducting an analysis of critical infrastructure in the state. In response to this interest, the Steering Committee Coordinator and representatives from several of the Steering Committee agencies met with NEMA personnel and provided technical assistance, including background

information on a range of issues that should be considered when establishing a GIS and on currently available geospatial databases. As a follow-up to this initial meeting, a detailed listing of available geospatial data and related contacts were provided and several agencies worked with NEMA to provide geospatial data to facilitate its initial critical infrastructure analysis.

To meet its short timeline for an initial critical infrastructure analysis, NEMA engaged the services of an outside GIS and geospatial data consultant. From a longer-term perspective, both the GIS Steering Committee and NEMA have noted the importance of developing sustainable institutional arrangements which will facilitate rapid access to current versions of geospatial databases that are maintained by a variety of agencies. In this regard. NEMA has expressed its interest in being involved in the new Advisory Committee on Facilitating Geospatial Data Sharing that is discuss later in this report.

Where We Are Going. NEMA's contract with an outside vendor, together with geospatial data provided by several agencies, will likely meet its immediate short-term GIS needs. However meeting its likely longer-term GIS and geospatial data needs will require a more integrated interagency planning effort. While there may be a few geospatial databases that are unique to Homeland Security applications, most of the geospatial databases needed for Homeland Security and other emergency response and public safety applications are developed and maintained by a variety of other agencies. It is also important to note that much of this data is fairly dynamic in nature. Consequently it is not practical for NEMA to gather and store one-time snap shots of this data for potential use in a future emergency, as the data would likely be out-of-date at the time of need. What is needed are institutional arrangements such that current versions of the best geospatial data are readily available for NEMA to access, when they are needed.

In a similar vein many of the geospatial databases required for emergency response planning are the same priority framework databases that many other agencies also need. To facilitate the rapid integration of these databases it is also important that these databases are developed following established National Spatial Data Infrastructure (NSDI) database standards. NEMA's needs to rapidly develop a GIS capability also illustrate the importance of having technical assistance available for new users and uses of GIS technology. In many ways, the long-term GIS needs of NEMA and other public safety agencies very closely parallel those of numerous other state, local, and federal agencies, as outlined in the 2000 GIS Strategic Plan. The events of September 11th have served to re-emphasize the importance of rapidly moving forward together to develop a shared spatial data infrastructure for Nebraska. These events have also underscored the importance of having public safety and emergency response agencies actively involved in these collaborative efforts.

DATA DEVELOPMENT GOALS AND INITIATIVES

One of the primary foci of National Spatial Data Infrastructure (NSDI) development is the development and maintenance of a core set of geospatial databases that are used in a wide variety of GIS/geospatial data applications. This report provides, for each prioritized database, an explanation for why it is a priority, an assessment of its current status, and an overview of anticipated future directions and issues.

PRIORITY DATABASE DEVELOPMENT AND MAINTENANCE. *Coordinate the development of widely needed digital geospatial databases in a standard reference format and establish systems for the on-going cooperative maintenance and enhancement of these priority geospatial databases.*

A core subset of geospatial databases is needed by a wide range of state, local and federal government agencies and private entities. The cooperative development and maintenance of these core databases is the most cost-effective means of providing these databases. These core databases also provide the framework for the development of numerous other0 geospatial databases. The cooperative development of standardized framework databases will minimized costly duplication of effort, facilitate data sharing and minimize costly data integration problems due to incompatible data.

A set of seven data layers or themes have been identified nationally as priorities for coordinated nationwide development:

Hydrography	Ortho-aerial imagery	Surface Elevation
Cadastral	Transportation	Administrative Boundaries
Geodetic Control		

Collectively, these data themes have been referred to as the "Framework" data layers because of the role they play in providing an underlying data framework for a very broad array of GIS applications. Because of the importance of these data layers, the Nebraska GIS Steering Committee has also prioritized their statewide development and maintenance. In addition to these framework data themes, the Nebraska GIS Steering Committee has also prioritized for statewide development three other data themes due to their specific importance to Nebraska:

Groundwater Wells	Soil Surveys	Street Addresses

FRAMEWORK LAYERS

Theme: Hydrography

Develop a statewide standard reference dataset for surface water features following the model for a High Resolution (1:24,000) National Hydrography Dataset (NHD) with common feature identifiers for all surface water features; and a proposed process for its on-going cooperative maintenance and enhancement.

Why it is a Priority. Surface water geospatial databases have been prioritized for development by both the Nebraska GIS Steering Committee and the Federal Geographic Data Committee because they are among a select subset of framework databases that provide basic data infrastructure for a wide cross-section of GIS applications and geospatial data users. The 2000 Annual Report and Strategic Plan provided more extensive background information and rationale about the needs for and importance of this geospatial database.

Because of the importance of surface water to Nebraska, numerous state, local and federal agencies collect, analyze, and use data related to surface water features (rivers, streams, canals, lakes, wetlands, etc.). It was noted in the 2000 Strategic Plan that there was no statewide, digital, surface water features geospatial database available that was sufficiently comprehensive, current, and at a scale of spatial accuracy and detail to serve as a standard reference database for these wide-ranging applications.

To illustrate the broad range of applications which would benefit from the availability of a standard reference, surface water features database, the 2000 GIS Strategic Plan outlined (in more detail) the following example applications:

- Floodplain Mapping — Nebr. Dept. of Natural Resources (NDNR)
- Water Rights — NDNR
- Dam Safety Program — NDNR
- Interstate Compact Administration — NDNR
- Watershed Planning — NDNR
- Development of Drainage Basin Characteristics — Central Platte NRD (CPNRD)
- Management of Water Quality and Stream Flow Sampling — CPNRD
- Fisheries Management and Enhancement — Game and Parks Commission (NGPC)
- Wildlife Management and Protection — NGPC
- Enhanced Lake Information — NGPC
- Surface Water Quality Enforcement — Dept. of Environmental Quality (NDEQ)
- Total Maximum Daily Load and Waste Load Allocations — NDEQ
- TMDL for Non-point Source — NDEQ
- Bridge Design — Nebr. Dept. of Roads
- Surface Water Buffer Strips — Nebr. Dept. of Agriculture and USDA Natural Resources Conservation Service

Current Status. Since the 2000 Annual Report and GIS Strategic Plan, an initial National Hydrography Dataset (NHD) pilot project has been completed for one watershed (Logan Creek) in northeast Nebraska. The Nebraska Department of Natural Resources was the lead state agency in this pilot project which was based on a workshare agreement with the US Geological Survey. In addition to developing the specific NHD database, as a result this pilot project NDNR has also gained an increased understanding of the database format, the unique development tools used, the processes and resources required, and the technical and policy issues involved.

Based on the experience gained in the first NHD pilot project, the GIS Steering Committee has worked with NDNR to organize two additional intergovernmental NHD projects. A Salt Creek NHD project in eastern Nebraska involves NDNR, the Lower Platte North NRD, and the Conservation and Survey Division – UNL (CSD-UNL). This project received a $25,000 grant from the Nebraska Information Technology Commission Community Technology Fund. Work commenced on this project in the fall of 2001. Another NHD project for the Lower Elkhorn Watershed, is a joint project involving NDNR, CSD-UNL, the Lower Elkhorn NHD, NDEQ, and NDOR. This project received a $25,000 grant from the Nebraska Information Technology Commission, Government Technology Collaboration Fund. Both of these projects will seek to control costs by working with the CSD-UNL to hire students to do the time-consuming hand digitizing work necessary to develop updated digital stream line-work (vectors). Both projects will also work with USGS to secure additional training, technical assistance and quality control.

Where We Are Going. This National Hydrography Dataset (NHD) project is the epitome of why the cooperative data development is so important. Interest in the NHD pilot project illustrates the widespread interest in and need for this database on a statewide basis. This interest suggests the possibility of support for a cooperative statewide NHD development effort from several state, federal and local government agencies. The initial pilot project, and the two follow-on NHD projects that are currently funded, should provide agencies with solid in-house experience upon which to base future NHD development plans. In designing a cooperative development program, an effort should be made to leverage existing technical resources from within state and federal agencies, and explore the possibilities of existing federal or state grants and/or project funding or other funding that might be applied to supporting this development effort.

It is possible to slowly continue to move this NHD development project forward by securing funding for one watershed development effort after another. However, such an approach will likely result in high administrative overhead and will inhibit potential project efficiencies by making it difficult to capture economies of scale and do long-range planning. Much can be gained by efforts to secure funding for either a comprehensive statewide effort, or, at the very least, multiple watersheds at one time. In the fall of 2001, NDEQ offered $50,000 from its Non-point Source Fund to support statewide NHD development, with the possibility of additional funding as part of broader collaborative efforts. These funds, together with the existing in-house NHD development expertise, should provide a catalyst for the Nebraska GIS Steering Committee and other state, local and federal agencies to pool their resources and develop a more comprehensive statewide NHD development initiative.

Theme: Digital Ortho Photography

Develop an updated statewide dataset of terrain-corrected (ortho-rectified) aerial photography at a 1:12,000 scale, one-meter resolution, based on 1999 imagery; and a proposed process for its on-going cooperative maintenance and enhancement.

Why it is a Priority. The Nebraska GIS Steering Committee and the Federal Geographic Data Committee have identified geo-referenced aerial photography as a high priority for development. This database is among a select subset of framework databases that provide basic data infrastructure for a wide cross-section of GIS applications and geospatial data users.

Orthoimagery refers to aerial photography that has been geo-referenced and corrected for errors due to camera angle and terrain displacement. Orthoimagery is used as a base map for a wide variety of GIS and geospatial analyses. Because all of the points on orthophotos are geo-referenced, it can be used to collect the shape and approximate locational coordinates of any surface feature that can be seen in the photo. This characteristic of orthophotos makes them a very cost-effective means for deriving other needed geospatial databases. Orthoimagery also provides a valuable visual backdrop for many abstract GIS maps and analyses and as such provide an important real world context for an abstract map.

Current Status. As a result of an earlier workshare agreement between the Nebraska Department of Natural Resources (NDNR) and the USGS, a statewide dataset of 1:12,000 scale digital orthophoto quadrangles (DOQs) was completed in early 1999 (source imagery 1993).

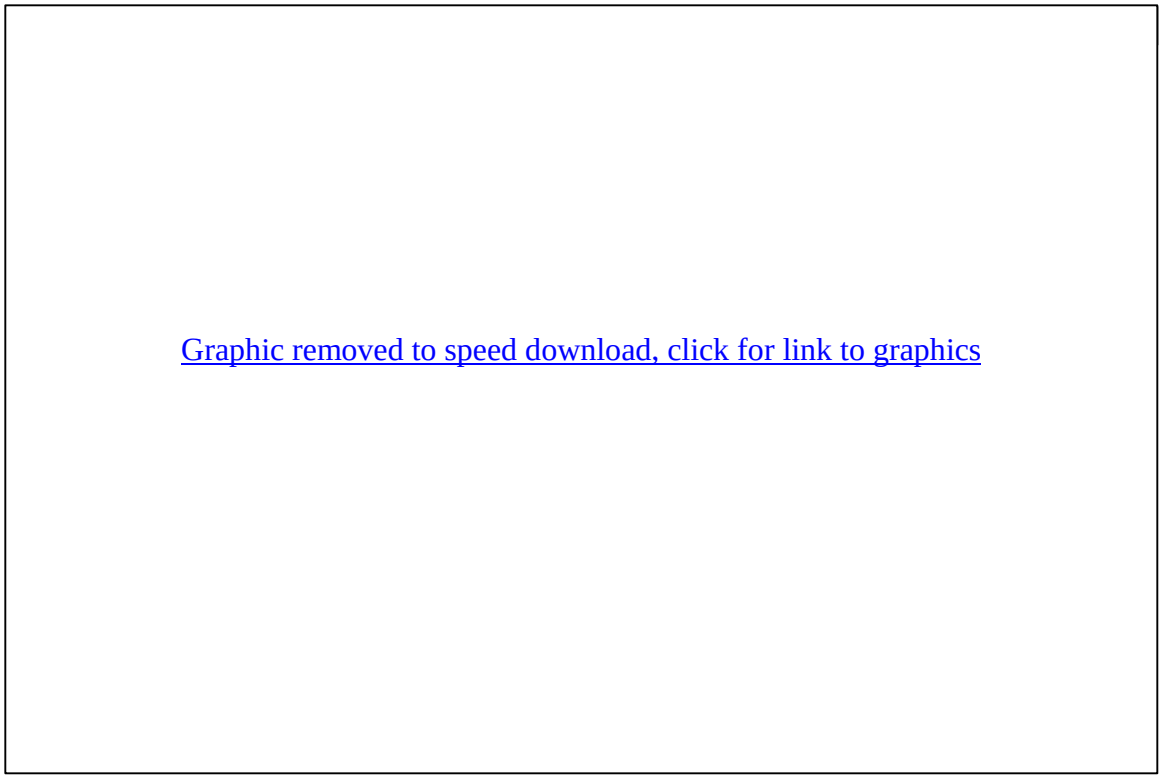

Figure 1. Status of Revised Digital Ortho Photography as of December 2001

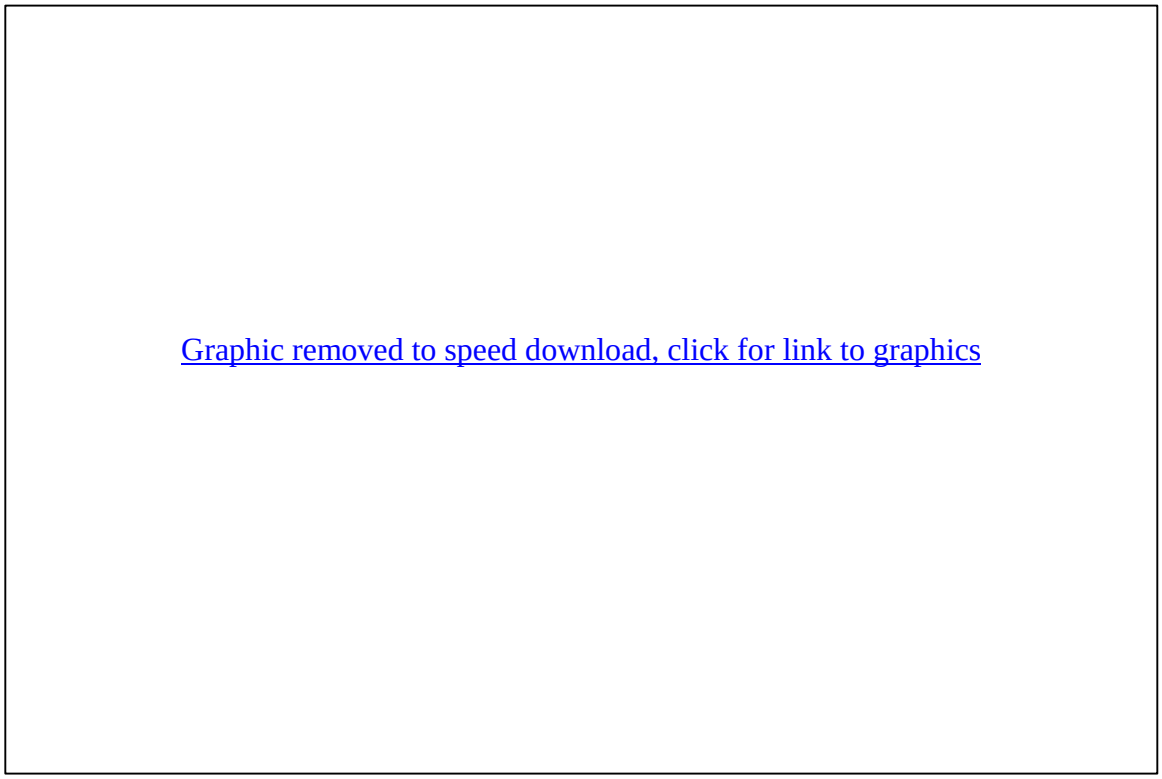

Figure 2. Status of Digital Elevation Model Development as of December 2001

In 1999, several federal agencies cooperated in contracting for statewide flights to collect new aerial photography for the geographic area of Nebraska. For some areas of the state, there were significant changes between 1993 and 1999. In response to a wide need for more recent geo-referenced aerial photography, the Nebraska GIS Steering Committee authorized the formation of an interagency Advisory Committee on Orthoimagery and Elevation Databases in late 1998 to study the related issues and make recommendations. Based on the results of a Lancaster County pilot project conducted by NDNR, the Advisory Committee recommended statewide development of revised DOQs, based on new 1999 source imagery and 10-meter DEMs and projected in both UTM and State Plane Coordinates. The GIS Steering Committee endorsed these recommendations.

The NDNR and the USGS have entered into a three-year workshare agreement that calls for the completion of statewide, revised DOQs based on 1999 NAPP imagery and 10-meter DEMs. At the time of this report, approximately 19 counties in southern Nebraska are completed and certified, 10 counties are completed and awaiting certification, and another 6 counties are in process *(see Figure 1, page 11).*

Where We Are Going. At the time of this report, this project is on track for completion of statewide DOQ coverage by June 30, 2003. Completion is, of course, contingent upon continued funding and support for this project at approximately the current levels at both NDNR and USGS.

Theme: Elevation

Develop a statewide surface elevation model dataset based on a 10-meter grid, and a proposed process for its on-going cooperative maintenance and enhancement.

Why it is a priority. Surface elevation models are another geospatial dataset that has been prioritized for development by both the Nebraska GIS Steering Committee and the Federal Geographic Data Committee because it is one of a select subset of framework databases that provide basic data infrastructure for a wide cross-section of GIS applications and geospatial data users. Most surface elevation models, commonly known as Digital Elevation Models (DEMs), are based on a regularly-spaced grid of points for which the elevation of the earth's surface is known at each point.

The availability of DEMs for a given area enables a wide variety of GIS applications to be undertaken for which the relative altitude or slope of the earth's surface are important characteristics. The availability of DEMs also provide the data infrastructure to enable a GIS to generate a 3-D model of the earth's surface and drape aerial photography and/or conceptual project plans over that 3-D model for a "real world" perspective. Some examples of DEM applications are as follows:

DOQs. DEMs provide the information that is necessary to remove the distortion of the earth's surface terrain from aerial photography and are therefore a necessary ingredient for the development of digital orthophoto quadrangels (DOQs).

Soils. DEMs provide information on the earth's surface features which is used to evaluate soil slopes, and assist in the process of updating and creating digital soil surveys from older paper county soil survey maps.

Floodplain and Watershed Delineation. The surface feature and hydrologic modeling capabilities possible through Digital Elevation Models (DEMs) are used in the delineation of floodplains and watershed areas.

Site Selection. DEMs provide the digital information necessary to develop 3-D models of the earth's surface and are therefore valuable tools for visualizing different views in the process of site selection for a wide variety of applications.

Current Status. As a result of the same three-year workshare agreement between the Nebraska Department of Natural Resources (NDNR) and the USGS that produced the Digital Orthophoto Quads (DOQs), a statewide dataset of 1:24,000-scale DEMs was completed for Nebraska in 1998. These DEMs are based on a grid of regularly spaced points, 30-meters apart, and were foundation databases used to develop the initial Nebraska DOQs.

In a follow-up pilot project to develop new DOQs based on newer 1999 photography, it was determined that the quality of DOQs were sufficiently improved with the use of 10-meter DEMs, over the 30-meter DEMs, and that the resources required to develop 10-meter DEMs were justified. Based upon the results of this pilot project, it was recommended that future statewide DOQ production (1:12,000) should be based on 10-meter DEMs.

As part of a NDNR/USGS workshare agreement that will develop new DOQs based on 1999 photography, work has begun on an effort to create statewide 10-meter DEMs. At the time of this report, 10-meter DEMs have been completed and certified for approximately 35 counties in the southern tier of Nebraska counties, another 15 counties have been completed but not certified, and another 13 counties are in process *(see Figure 2, page 11).*

Where We Are Going. Completion of statewide 10-meter DEMs is currently expected around December 2002. This is contingent upon continued support for this project at approximately the current leave at both NDNR and USGS.

Theme: Cadastral

Develop a statewide standard reference Public Land Survey System (PLSS) dataset including all of the section and quarter section corners, their estimated locational coordinates, and standard identifiers for each PLSS corner; and a proposed process for its on-going cooperative maintenance and enhancement.

Why it is a priority. The Nebraska GIS Steering Committee and the Federal Geographic Data Committee have both identified the cadastral/PLSS database as a high priority for development. This database is among a select subset of framework databases that provide basic data infrastructure for a wide cross-section of GIS applications and geospatial data users. A geospatial cadastral database provides both standard identifiers and locational (latitude/longitude) coordinates for the PLSS corners.

The PLSS section corners in Nebraska are the basis for defining all land ownership in our state. Establishing reasonably accurate locational coordinates for these corners provides a necessary foundation for modernizing local government land records. There are approximately 100,000 such PLSS section corners in Nebraska, and they were originally surveyed roughly 125 years ago. In theory these PLSS section corners define one-mile squares, but the practical reality is that there are wide variations in the actual distance between the original placement of these corners.

However, it is the original placement of these corners that legally defines all land ownership parcels. Determining the "real world" coordinates of these original corner placements is one of the biggest hurdles that are slowing the adoption of modern geospatial technologies to manage and access land ownership records. A wide range of state, local and federal government agencies and private sector entities utilize land ownership data. Since the PLSS is the legal foundation for defining all land ownership parcels in Nebraska, and geospatial land ownership data is needed by a wide variety of entities, the development of a geospatial PLSS database must be a key component of the state's data infrastructure development plans.

Current Status. Currently there are two relatively low-resolution, statewide Nebraska PLSS databases available for public use. The Nebraska Department of Natural Resources (NDNR) developed a statewide PLSS database in the early 1990s and another was developed by the Bureau of Land Management (BLM) in 1997 to provide a basis for Nebraska PLSS pilot projects. Using different methodologies, both databases were derived from digitizing section corners, as shown on the USGS 1:24,000 topographic quad maps, and therefore have a spatial accuracy, which cannot be verified without extensive investigation. The two databases have been cross-checked and adjusted for obvious errors. While these two databases were derived from the same source data, they each incorporate some distinct built-in features (identification schemes, attributes, etc.), that facilitate their use in specific applications. The 2000 Nebraska GIS Strategic Plan called for the State Surveyors Office and the NDNR to work together to integrate the best features of these databases to create one standard cadastral database, with standard identifiers for all PLSS corners.

In some of Nebraska's more populous areas, local governments have independently developed enhanced cadastral databases. While these locally derived cadastral databases reflect a significant investment by local governments, they cover only a relatively small geographic area of Nebraska's large land area.

A 1997-98 joint pilot project effort by the GIS Steering Committee and the State Surveyors Office tested both a methodology and an organizational model for the cooperative development of an enhanced cadastral database. As a result of this cooperative initiative, PLSS pilot projects were implemented in three of Nebraska's counties (Adams, Merrick, and Dawson). These projects focused on testing the applicability of a software methodology developed by the US Bureau of Land Management (BLM). The pilot projects were also designed to test the organizational feasibility of relying primarily on local government partners to actually do the bulk of the data development. The results of these pilot projects showed that the software approach was valid for the development of an enhanced, upgradeable cadastral. However, the organizational approach of relying primarily on local government personnel for data development did not appear to be workable in most situations. Since these initial cadastral pilot projects, this methodology has been used only to a limited extent, primarily due to the lack of resources to apply the methodology on a broader scale.

Current resources available in the State Surveyors Office allow that office to respond, in a limited manner, to unique opportunities to assist specific counties or agencies if they wish use this methodology to develop a cadastral database for their counties. Significantly more resources will be needed to develop a statewide, common reference cadastral database and thereby provide the data infrastructure needed for the statewide modernization of land records in compatible formats.

While the PLSS pilot projects demonstrate the widespread support for cooperative cadastral efforts, they also suggested that totally voluntary, decentralized efforts are not a practical, cost-effective approach for the development of this database. In response to the need to develop practical mechanisms for intergovernmental partnerships in this area, the Nebraska GIS Steering Committee has worked with the key organizational players to outline a Project Charter for a Nebraska Land Record Modernization Study. It would be the intent of this study to engage the cross-section of interested institutional entities in a process to define a collaborative approach for developing and maintaining statewide digital cadastral data. The development of this Project Charter was undertaken based on an understanding that limited funding would likely be available to support such a study as part of US Geological Survey (USGS) support of Nebraska I-Team planning. At the time of this report, efforts to undertake this Land Record Modernization Study are on hold, pending final arrangements with USGS related to the availability of these funds. Additional discussion of this initiative is available as part of the Land Record Modernization goal discussion later in this report.

The need to develop practical mechanisms for intergovernmental partnerships and collaboration for the cadastral has also been recognized at the national level, as illustrated by a Western Governor's Association (WGA) cadastral resolution passed in June 2000. Partly in response to the WGA resolution, over the last year there has been is an increased level of discussion and proposal development between the US Bureau of Land Management (BLM) and states to explore avenues for further state, local and federal collaboration in cadastral development and maintenance. Most of these national cadastral discussions have revolved around two initiatives, one focused on the states involved in the WGA, and the other focused on the rest of the nation and referred to as the Eastern States Cadastral Initiative. In these discussions, Nebraska, and the others states in a north/south tier of states running from North Dakota to Texas, finds itself in the unfortunate situation of not being well integrated into either of these initiatives. Most of the states in the WGA share the characteristic of federal government agencies owning or managing 50% or more of the land in those states. Because of this reality, these federal agencies have been actively involved in land record modernization in those states. While the north/south tier of states that includes Nebraska are formally part of the WGA, they are “unique” in that so little of land is owned or managed by the federal government. Consequently, this tier of states has not been well integrated in previous federal cadastral efforts, nor do they easily fit within current initiatives. On the other hand, the Eastern States Cadastral Initiative has focused on outlining proposals for those states where, in the past, the federal government has not been particularly active with cadastral efforts. Unfortunately, geographic area of this initiative has been defined as including those states not part of the WGA (including Iowa and Missouri, but not Nebraska). Consequently this tier of states, including Nebraska, find themselves somewhat the “odd man out” in these current national cadastral policy discussions and proposal development efforts.

Where We Are Going. While new technical issues and concerns will undoubtedly surface, many of the technical issues (methodology, standards, etc.) have been addressed as part of the Nebraska PLSS pilot project efforts. To move forward with the objective of creating a standardized, statewide cadastral database, there are at least four areas of needed focus, in the near term.

Merging Existing Low-Resolution PLSS Databases. There currently exists two relatively low-resolution, statewide PLSS databases available for public use. Both were derived from digitizing section corners as shown on the USGS 1:24,000 topographic quad maps and therefore have a spatial accuracy which cannot be verified without extensive investigation. A

considerable amount of error checking has already been done between the two databases. Efforts by NDNR and the State Surveyors Office to integrate the best features of these two databases would create one standard, low-resolution PLSS database, with standard identifiers for all PLSS corners. This low-resolution PLSS database could then serve as an interim common reference cadastral database and also serve as the framework for on-going cooperative efforts to develop an enhanced cadastral database.

Development of Intergovernmental Model. The biggest challenge is to engage the various stakeholders in a collaborative process to develop a rough consensus around an intergovernmental model that can facilitate the cooperative development and on-going maintenance of this core infrastructure database. Such a process will likely need to make recommendations that will involve legislation and funding issues. For such a process to ultimately be successful, it will be important to have support for the process from policy makers in both the Executive and Legislative branches and key associations representing the various stakeholders. The Nebraska Land Record Modernization Study, as defined in the draft Project Charter developed by the GIS Steering Committee, is designed to address this challenge. Efforts should continue to work with the USGS to secure funding for and to conduct this study. In the unanticipated absence of this USGS funding, other avenues will be explored for conducting the study.

Engagement in National Cadastral Dialogue. Given the "poor fit" of Nebraska and the other states in its north/south tier, in either of the two state/federal cadastral initiatives currently being formulated, it will be important that representatives of the Nebraska GIS Steering Committee and the Governor's Office actively engage in these dialogues.

Cadastral Enhancement As Opportunities Allow. Until a more comprehensive approach has been developed for cadastral enhancement, the Nebraska GIS Steering Committee and the State Surveyors Office will actively encourage public and private entities to work with the State Surveyors Office to do any cadastral development in a format consistent with the database model developed in the PLSS pilot projects. To the extent that the State Surveyors Office has resources available, they will provide assistance to state, local and federal government entities in this pursuit.

Theme: Ground Transportation

Develop a statewide (1:24,000) transportation network dataset for all state-maintained highways and all local roads, including a system of common reference identifiers for each road segment; and a proposed process for its on-going cooperative maintenance and enhancement.

Why it is a Priority. A comprehensive statewide transportation network database is another geospatial dataset that has been prioritized for development by both the Nebraska GIS Steering Committee and the Federal Geographic Data Committee. It is a priority for development because it is one of a select subset of framework databases that provide basic data infrastructure for a wide cross-section of GIS applications and geospatial data users.

A comprehensive statewide transportation network database would include an accurate geospatial representation of the location/route of the state's highways, roads and streets along with standard identifiers for each road feature and at least a minimum subset of attribute data related to those roads. For a state like Nebraska that covers a large geographic area, highways and other roads are critical components of the public infrastructure. As we move

increasingly into the digital world, so too has digital geospatial information about those road networks become critical components of the data infrastructure that is important for a wide range of applications. Among the applications for which geospatial road network databases are important are the following which were outlined in more detail in the 2000 Nebraska GIS Strategic Plan:

- Transportation Planning
- Highway and Road Maintenance
- Economic Development
- Transportation Routing
- Public Safety and Emergency Response.

Current Status. Nebraska has approximately 95,910 miles of state and local roads. Within the past decade, Nebraska Department of Roads (NDOR) has created, and continues to maintain digital graphics and associated attribute records for 9,967 miles of state-maintained highways in Nebraska, at a scale of 1:24,000. Another 10,367 miles of local arterial routes and 8,839 miles of local collector routes have also been added to the agency's GIS base map. Therefore approximately 30,000 miles of state and local roads are currently in the NDOR GIS transportation database, out of an overall statewide total of 95,910 miles.

In 1999-2000, NDOR worked with an interagency Transportation Database Advisory Committee of the Nebraska GIS Steering Committee to devise a strategy for how the remaining approximately 66,000 miles of local roads might be integrated into the NDOR statewide road network database to form an initial comprehensive ground transportation database. The strategy developed called for NDOR to convert existing graphic/non-GIS local roads files into GIS format so that they might be incorporated into the statewide geospatial transportation database. June 2002 was established as a target for completion of this initial phase. NDOR is currently working on this effort and at the time of this report it has completed 53 counties, with three more in process *(see Figure 3, page 18).*

The Advisory Committee also recommended that to provide a means for maintaining and upgrading the local features in its database, NDOR should take the lead in working with local governments to develop a system of common identifiers for all geospatial road network features (road segments, intersections, etc.) consistent with NSDI Framework Transportation Identification Standards. NDOR established a goal of adopting and incorporating these standard transportation identifiers by June 2003.

Where We Are Going. NDOR has recently completed an agency-wide GIS Strategic Plan. The initiatives outlined above have been incorporated into that NDOR strategic plan and it is anticipated that the resources will be available from existing agency funding. It is currently anticipated that an initial comprehensive, statewide geospatial transportation network database that includes all the state and local highways, roads and streets will be able by June 2002.

By the June 2002 date, most of the local roads that have been incorporated will not have much in the way of related attribute information. To provide a means to work with local government to provide attribute information and update the line work, a system of common identifiers for transportation features must be adopted and implemented. Over the next year, NDOR and the GIS Steering Committee will work with local governments to develop a

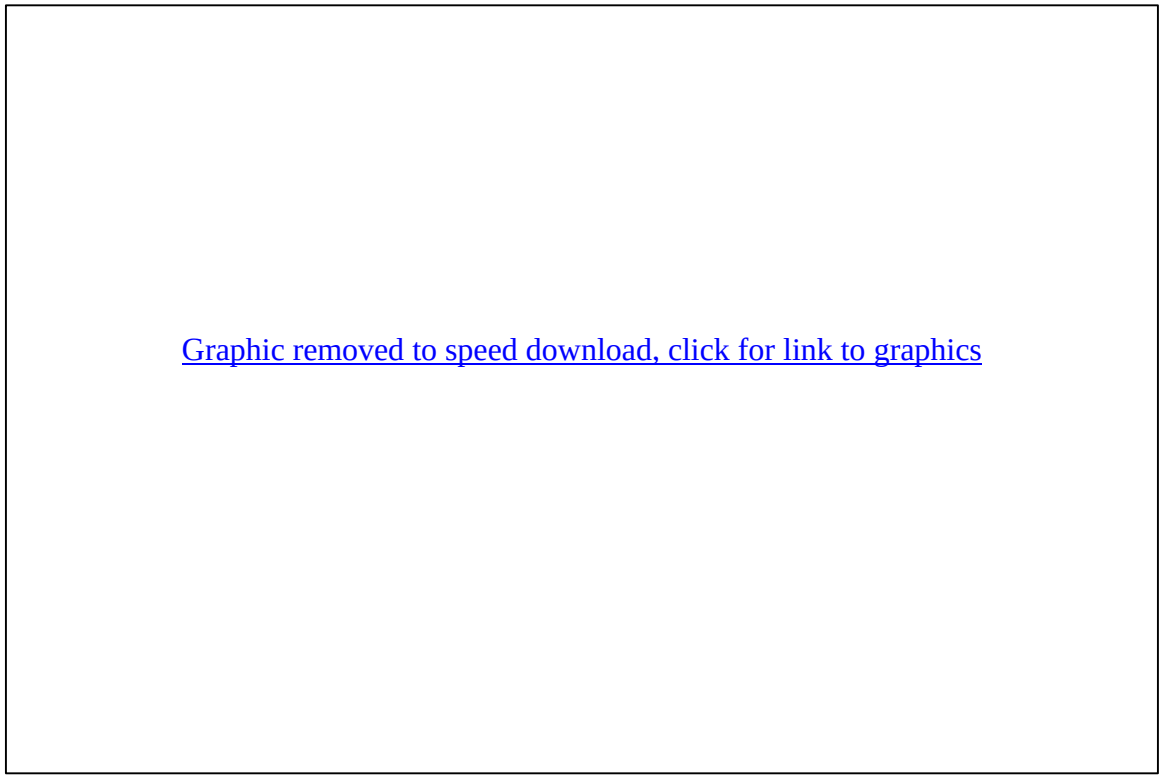

Figure 3. Status of NDOR project to incorporate local roads into GIS Transportation Database

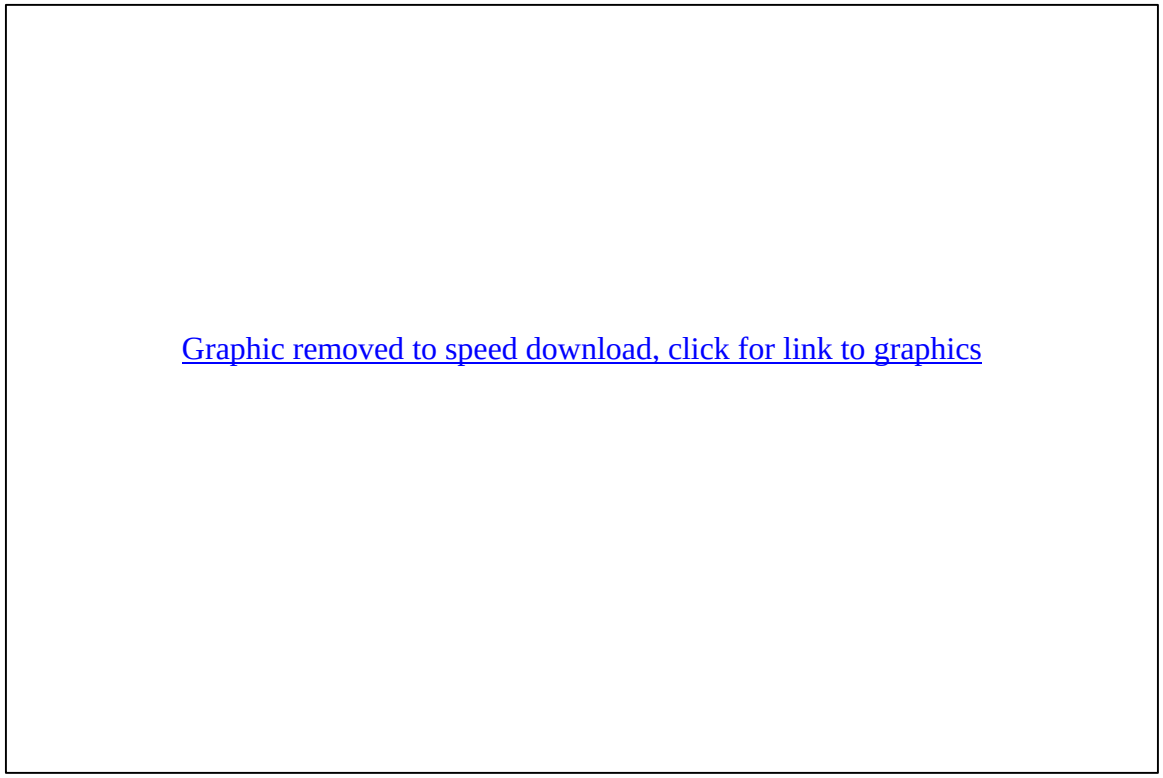

Figure 4. Status of effort of develop digital SSURGO county soil survey database.

system of common identifiers. The current timeline calls for the adoption and incorporation of these standard transportation feature identifiers by June 2003.

Theme: Administrative Boundaries

Develop a statewide (1:24,000) geospatial dataset of the key Nebraska governmental unit boundaries and a proposed process for its on-going cooperative maintenance and enhancement.

Why it is a Priority. A set of geospatial databases that provide both the location and shape of the key governmental unit boundaries (municipal, congressional or legislative district, counties, etc.) is another dataset that has been prioritized for development by both the Nebraska GIS Steering Committee and the Federal Geographic Data Committee. It is a priority for development because it is one of a select subset of framework databases that provide basic data infrastructure for a wide cross-section of GIS applications and geospatial data users.

A wide variety of data collection activities and public policy decisions involve referring to a given activity or resource relative to its location within a particular governmental unit. The availability of geospatial databases that outlines these governmental unit boundaries allows the use of geospatial technology to analyze data relative to its particular governmental unit and facilitates achieving public policy objectives relative to those governmental units.

Current Status. A Governmental Units Database Advisory Committee, of the Nebraska GIS Steering Committee, identified a core set of governmental unit boundary databases that are widely needed, assessed their current availability, and developed some recommendations for their development, maintenance and distribution. That Advisory Committee found that the following core geospatial governmental unit databases have been developed by a variety of agencies and are currently available to the general public and public agencies:

Legislative Districts	Congressional Districts	State Board of Education
Board of Regents	Supreme Court Districts	Voting Precincts
NRD Districts	Counties	Township/Range
Fire Districts	Game and Parks Districts	School Districts

The Advisory Committee also found that while information on the governmental boundaries listed below was available in a paper format, it was not apparent where current information on these boundaries can be reliably accessed in a digital, geospatial data format.

Municipal Boundaries	Tribal Lands	Public Power Districts

Since the Advisory Committee issued its report, the Nebraska Department of Roads has indicated that they will develop and maintain a reasonably current (updated annually) coverage of the Nebraska municipal boundaries. At the time of this report, the NDOR municipal boundary coverage was approximately 85% complete. A reasonably current municipal boundary coverage is also available through the 2000 Census data. Since the Advisory Committee issued its original report, the Nebraska GIS Steering Committee has been informed that digital geospatial Tribal Land boundaries, within the State of Nebraska, are available through the Bureau of Indian Affairs.

The Advisory Committee noted that most of these boundary databases were maintained by and available from a variety of agencies. However, for the average GIS user it was not always readily apparent how one would go about finding and getting a copy of these databases. The Advisory Committee also noted that while these governmental boundary databases are available, many of them are not currently documented with standardized metadata which facilitates both their cataloging in geospatial data clearinghouses and allows users to evaluate and properly utilize the databases.

Where We Are Going. The GIS Steering Committee will work with agencies that maintain governmental unit boundary databases to encourage them to develop standardized metadata for those databases that are not currently so documented. These agencies will also be encouraged to list their databases in the Nebraska Geospatial Data Clearinghouse (http://geodata.state.ne.us/), as a means to make this data more readily accessible to the GIS user community. As part of its agency-specific GIS strategic planning initiative, the Dept. of Roads decided to include municipal boundaries in its overall geospatial database. The effort by the Dept. of Roads to incorporate and annually update, this municipal boundary data in their geospatial database will provide a source for this key geospatial database that was not previously available.

Theme: Geodetic Control

Maintain a statewide database that provides the locational coordinates, identifiers, and background information on monumented geodetic control points in the State of Nebraska.

Why it is a Priority. The Federal Geographic Data Committee has identified Geodetic Control as a high priority for development. This database is among a select subset of framework databases that provide basic data infrastructure for a wide cross-section of GIS applications and geospatial data users. This database provides the foundation for tying all other geospatial databases to a common spatial reference framework and therefore enables other databases to be combined and analyzed based on this common spatial reference.

Current Status. A 1998 report, developed by the State Surveyor, on the Geodetic Control data available for Nebraska noted the following. "The current data set is somewhat fragmented. National Geodetic Survey (NGS) provides information on all control, which has been submitted, for inclusion in their data. This information is disseminated in many forms including optical discs and the Internet. Individual agencies such as Nebr. Dept. of Roads, Nebr. Dept. of Natural Resources, and County Surveyors maintain records of monuments not submitted for inclusion in the NGS set. In some cases this information is difficult to locate and not available in digital form."

"The creation of a database for geodetic control monuments, beyond that maintained by NGS may not be a good idea at this time. The use of GPS for survey quality geodetic control is increasing as accuracy improves and cost declines. Users of GPS do not have the same requirements as those who employ conventional surveying methods. Conventional surveying methods require control monuments to be reasonably close to the work area (usually 5 kilometers or less). Survey quality GPS methods extend this range considerably to a point where the monuments contained within the NGS data are usually adequate. Local counties who have enacted zoning ordinances requiring geo-referencing for new subdivisions have a need for control beyond that provided by NGS. Many Land Surveyors do not have GPS capability and make the connections by conventional survey methods. In the case of

Lancaster County, the County Surveyor has improved the density of the control and makes it available to the public."

In 1996, NGS and several Nebraska partners cooperated in the development of High Accuracy Reference Network (HARN) for Nebraska. This HARN network consists of 214 monumented control stations scattered across Nebraska for which the locational coordinates have been determined, to a very high degree of accuracy, with the use of Global Positioning Satellite (GPS) technology. This HARN data is available through the NGS database.

Where We Are Going. The current assessment is that for a wide range of GIS applications the current statewide geodetic Nebraska control network and its associated NGS database probably provide adequate horizontal control. However, for some local GIS implementation projects, there may be merit in establishing additional local geodetic control. It was the assessment of this working group that efforts to enhance vertical control (elevation) should be of a higher priority than efforts to enhance horizontal control. There is currently an effort underway to organize a Lancaster County Height Modernization pilot project in 2001-2002. This effort will focus on improving the vertical measurements for existing control points in the county.

NON-FRAMEWORK LAYERS

In addition to the Framework data layers outlined above, the Nebraska GIS Steering Committee has also identified three additional datasets that it feels should be priorities for statewide development, due to their unique importance to Nebraska. These three additional priority data layers are: ground water features – wells, soil surveys, and street addresses.

Theme: Ground Water Features - Wells

Develop a standard, cooperative system for uniquely identifying water wells, indexing data related to those wells, and for progressively enhancing the available information on the location of each water well.

Why it is a priority. In late 1998 the Nebraska GIS Steering Committee authorized the formation of an interagency Water Resources Database Advisory Committee to study the need for water-related geospatial databases and make recommendations. The Advisory Committee identified 26 water-related databases needed by the interagency Committee members. Of those 26, the Advisory Committee ranked the surface water features as its highest priority and the groundwater/water wells database as its number two priority for development.

Because of the importance of water to Nebraska, numerous state, local and federal agencies collect, analyze and use data related to water wells and the associated groundwater. As a result of a variety of programs in different agencies, a large volume of data related to wells and groundwater has been collected, and continues to be collected. Unfortunately, the lack of a universally applied water well identification scheme makes it very difficult and costly to integrate this data across the different programs and agencies. For many programs, enhancing the ability to share, integrate and analyze groundwater data across programs and agencies would provide a more cost-effective way to achieve program goals and to monitor program results.

Personnel from a given agency frequently need to make repeat visits, over a period of time, to a particular well to collect water samples. In some areas, there are numerous wells located in close proximity to each other without obvious physical features to make them uniquely stand out. Absent a unique identifier placed on a particular well, it is sometimes difficult to insure that agency personnel are indeed getting repeat samples from the same well. This difficulty is compounded if the sample visits are separated by several months of time and/or made by different personnel from the same or a different agency. This difficulty is further compounded when one attempts to integrate data collected from supposedly the same well by multiple agencies, without the benefit of a unique well identifier placed on that particular water well to provide a common unique reference.

In a similar manner, accurate information on the location of water wells is increasingly important to many programs. The water well locational data most readily available to most users is from the Registered Wells Database, which contains information on over 100,000 registered wells and is maintained by Dept. of Natural Resources (NDNR). In most cases, this locational data was derived from mathematical estimates based on the center of Public Land Survey System (PLSS) sections or distances from the PLSS corners, as recorded on the well registration form. For many of today's applications, this locational information is not sufficiently accurate, particularly when there are multiple wells in relatively close proximity.

Current Status. Over a period of years, different agencies have developed and maintained separate identification schemes that are used to index the water well and groundwater data they collect and maintain. The closest approximation we have to a universal well identifier system is the Registered Well ID maintained by NDNR. Unfortunately, even though they are legally required to be registered, many wells are not. Even when they are registered, it is sometimes difficult to determine the registered well ID when one is in the field taking samples, as there is no identifier placed on the well itself. Because of this problem, a few Natural Resource Districts (NRDs) have begun to place their agency-specific identifier tags on wells as they visit them in the field.

Because of the growing importance of having relatively accurate information on well locations, many agencies are now investing public resources to use Global Positioning Satellite (GPS) technology to collect more accurate locational coordinates on water wells. Unfortunately, there has been no systematic, interagency program in place to make this more accurate locational information collected on specific water wells generally available to the broader user community.

An interagency Working Group was established by the Water Resources Database Advisory Committee to research and develop an action plan to address the need for a standard reference water well database, with enhanced locational coordinates for wells. That Working Group initially focused on the challenge of making enhanced data on the location of water wells available to the larger user community. A 1999 survey of state, local and federal agencies, discovered that GPS readings had already been collected on over 17,500 wells by NRDs, NHHS, NDEQ, and USGS, with future plans of collecting GPS readings on over 6,500 wells/year. The problem was lack of any systematic method for making the results of these individual agency efforts available to the larger community. The Working Group developed consensus methodologies for documenting how enhanced locational data on wells was derived and general conceptual agreement for procedures to integrate this data into the Registered Wells Database maintained by NDNR. The Nebraska GIS Steering Committee

passed a resolution supporting the Working Group's recommendations and urging agencies' support for their implementation.

The Working Group is also looked at the difficulty of integrating existing water well-related databases across agencies and programs. The Group determined that the key to overcoming this is the implementation of a standard water well identifier that could be used to cross-reference the various databases. The Group has also suggested that for such a common identifier system to be successful implemented, it is important that this common, unique well identifier be physically attached (tagged) to the well to provide a means for the various agencies to collect and then enter this well identifier into their databases as they visit the well sites. The Group's recommendations suggest that the most effective and practical first step is to require that such an identifier be placed on all new wells as they are registered. The Group's recommendations also suggest coupling this tagging of new wells with an effort by state and local agencies to tag existing wells, as those agencies visit the well sites in the course of their regular work. A parallel, and complementary approach, is an effort by the Nebraska Water Center to develop a cross-reference database of the various ID schemas.

Since the issuance of this Working Group report, initial follow-up efforts have focused on initiatives to get more wells legally registered and therefore incorporated into the Registered Wells database. The Nebraska Legislature, in 2001, passed new statutory language requiring that the licensed well drillers, instead of the well owners, register new wells. To further facilitate well registration, NDNR has also developed an online well registration process, which is expected to be operational at the beginning of 2002. In addition, there has been an increased focus on interagency efforts (NDNR, NHHS, and NRDs) to identify existing, non-registered wells and encourage the owners (public and private) to register these wells, as required by statutes.

Where We Are Going. Efforts to incorporate the enhanced GPS well locational data, which has been collected by other agencies, into the NDNR Registered Wells Database has been delayed by the lack of available resources. As additional resources become available, it is hoped that this GPS locational data collected by one agency can be shared with others by incorporating it in the Registered Wells database. Initial responses to the Working Group's recommendation that physical identification tags should be placed on all wells was mixed from some of those agencies that would need to be involved. Further interagency discussion will be necessary if that proposal is to move forward.

Theme: Soil Surveys

Develop a statewide (1:24,000 and 1:12,000 in some areas) dataset of digital county soil survey data (SURRGO) including unique identifiers for each soil type; and a proposed process for its on-going cooperative maintenance and enhancement.

Why it is a Priority. Because of the overall importance of agriculture to Nebraska's long-term social and economic well-being, the development of digital soils data is another statewide geospatial databases that has been prioritized for development by the GIS Steering Committee. The development of high resolution, digital county soil survey data, in a geospatial format, will provide key data that is needed for farm and ranch management applications to take advantage of GIS technology. Geospatial soil data also provides key information that can be used, in combination with other data, for siting facilities such as landfills, housing developments, and sanitary lagoons. This digital geospatial soils data is

also an important factor in determining the value of property for assessment purposes. The federal government has prioritized the development of digital SSURGO soils data and has made available to US Natural Resources Conservation Service (NRCS) specially earmarked funding to support these efforts during a five-year window of FY 1997-2002.

The NRCS originally developed the paper County Soil Survey Manuals. These county soil manuals contain maps that outline the approximate shape and location of areas with similar soil characteristics, and provide detailed associated information on the characteristics of each particular soil type. The NRCS has developed national standards (known as SSURGO) for the conversion of these paper maps to digital geospatial format. As part of the process of conversion to digital SSURGO format, the spatial accuracy of the county soil maps will be enhanced by recompiling the maps on a DOQ base map. When one considers that Nebraska includes approximately 49,500,000 acres or 77,355 square miles of area, the overwhelming magnitude of the task of converting these paper soil maps to digital geospatial format becomes apparent.

Current Status. Four years ago, three agencies (USDA-NRCS, Conservation and Survey Division-UNL, and the Nebraska Natural Resources Commission) initiated a large-scale, joint effort to develop statewide digital county soil surveys at a 1:24,000 map scale. Prior to initiated in this large-scale development effort, the only available statewide digital vector soils database was at a more generalized map scale of 1:100,000. As of November 2001, SSURGO soils data has been completed and certified for 63 Nebraska counties, with several other counties in differing stages of development *(see Figure 4, page 18).*

Where We Are Going. The goal of this joint development effort is to develop statewide SSURGO digital county soil maps by June 2003. The project is currently on schedule. Assuming that continued funding is available for the three primary agencies, it is expected that statewide SSURGO soils coverage will be completed by June 2003.

Street Addresses Database

Develop a statewide (1:24,000) dataset with all street centerlines and standard street address ranges for each street segment; and a proposed process for its on-going cooperative maintenance and enhancement.

Why it is a Priority. As the human services-related applications (education, welfare, public safety, emergency response, etc.) of GIS technology have grown, a parallel need for a geospatial street address databases has also grown. A geospatial street address database includes a map of street centerlines and attribute data that provides the street address ranges for each side of a street segment (i.e. for each city block). Such a geospatial street address database provides the foundation data for a process known as geo-coding, the efficient, large-scale determination of the locational coordinates for common street addresses. This then allows common street addresses to be plotted on a map and integrated with a wide variety of other spatial data. While human services-related applications are one of most common areas of need for geospatial street address databases, they are also used for other applications such as determining the spatial coordinates for regulated facilities, emergency response or transportation routing.

Current Status. There is a growing use and interest in street address geospatial databases by state agencies such as the Nebraska Health and Human Services System (NHHS) and state

and local government agencies for emergency response. Street address geospatial databases are currently available from both the public and private sector. There is considerable variability in the overall quality, currentness, and costs of these databases. One of the most common and readily available street address geospatial database is the TIGER files developed and maintained by the US Census Bureau. The overall quality of the TIGER database is fair, however, it has enough problems that a market has developed to support the efforts of private firms to enhance the TIGER database and sell the resulting product. The quality and currency of the TIGER data varies by geographic area and the more rural areas frequently have poorer overall quality. The use of private street address databases can be costly and usually involves a license agreement, which prohibits the sharing of the database with other users. Some local governments are developing local street address databases for use within their E911 operations or broader local GIS applications. These needs are likely to grow because of new regulations related to emergency response and cellular phone usage. State and local government agencies have in the past used both public and privately available street address geospatial databases.

Where We Are Going. An interagency exploration is needed to determine the aggregate demand for this type of data and to research the possibilities for partnership in developing or licensing a street address geospatial database for shared public agency use. On the federal level, there are discussions between the Census Bureau, the Bureau of Transportation Statistics–USDOT, and the USGS related to the development of a shared transportation/address database standard. Even with nationally defined standards, these federal agencies would likely look to partner with state and local governments to develop and maintain this dynamic data. The 2000 Nebraska GIS Strategic Plan noted the need to convene an intergovernmental Street Address Database Advisory Committee to make recommendations on the possibilities for a shared street address geospatial database. At the time of this report, such an Advisory Committee has not been established.

NON - DATA DEVELOPMENT GOALS AND INITIATIVES

In addition to the long-range goal related to the development of priority databases, the GIS Steering Committee has identified five other long-range goals or initiatives that it sees as directly related to "*Building a Spatial Data Infrastructure for Nebraska"*. This section provides an update on activities related to these non-data development initiatives.

LAND RECORDS MODERNIZATION INITIATIVE. *Promote and facilitate local government land record modernization and GIS development.*

Why it is a Priority. One of the most promising and cost-effective application areas of GIS technology is the modernization of how local government land records are maintained and accessed. The property parcel/land record information maintained by local governments is also one of the geospatial databases that are needed by a wide variety of state, local and federal agencies and private entities. It is in the interest of the broader GIS user community that this land record information be developed in a standardized geospatial format that is accessible to multiple users at the local, state and federal level. Because of the limited resources available at the local government level, partnerships will be necessary in many areas to facilitate the development and maintenance of this data.

The 2000 Nebraska GIS Strategic Plan identified several initiatives that would help to facilitate the process of modernizing these local government land record systems and the development of the digital geospatial property parcel databases that are needed for a variety of state, local and federal applications. These initiatives included:

- The development of two statewide framework geospatial databases: the Public Land Survey System (PLSS) and digital ortho-imagery.
- The development of a set of guidelines and background education material to assist local government in the modernization of their land records and the development of a multipurpose local GIS.
- The development and distribution of model inter-local agreements for the cooperative development, maintenance and funding of geographic information systems core data.
- The exploration of the support for and feasibility of developing regional professional service centers to assist local governments and other public entities to aggregate and provide for their surveying, mapping, GIS, and the possibility other professional service needs.
- The implementation of an educational outreach program designed to maximize the overall return on local government investments in the development of geographically referenced databases and GIS systems by providing educational materials, presentations and coordination services to the public officials who will be making these investment decisions.

Current Status. The status of the efforts to develop statewide digital geo-referenced aerial photography and a Public Land Survey System database are outlined elsewhere in this report, under the Priority Database Development and Maintenance Initiative. Together, these two databases would provide the foundation base maps necessary for the development of geospatial property parcel databases.

Since the publishing of the 2000 GIS Strategic Plan, the intergovernmental Advisory Committee on Standards for Multipurpose Land Information Systems has developed drafts of four

additional sections for its Nebraska Guidebook for Local Government Multipurpose Land Information Systems. Three of these draft sections have been formally approved by the Steering Committee and the fourth is still in a review process. While not all the sections originally envisioned for this guidebook are yet completed, the 90+ page Nebraska Guidebook has been widely circulated among local government officials and the private vendor community.

In Nebraska, land records are maintained at the local government level and the dynamic public information related to land ownership flows through local government offices. Therefore, as a necessity, local governments must be integrally involved in any land record modernization effort. However, many local governments do not have the resources to undertake land record modernization themselves. Many regional, state and federal agencies also have an interest in the development and maintenance of modern geospatial land records in a consistent and statewide-compatible format. In Nebraska, one of the biggest hurdles to land record modernization is the lack of a consensus around a policy and structural framework that will facilitate local, regional, state, and federal agencies collaboration, on an on-going basis, to support land record modernization.

In pursuit of such a policy/structural consensus, the GIS Steering Committee has worked with many of the key institutional players to develop a project charter for a Nebraska Land Record Modernization Study (http://www.calmit.unl.edu/gis/LRM_Project_Charter8-9-01.pdf). The goal of this study would be both to outline the issues and possible alternatives for a collaborative land record modernization initiative and to then bring together the key players and constituencies in a process to explore the possibilities for a consensus approach. The project charter for this study was developed with the understanding that funding to underwrite such a study would likely be available through the USGS. At the time of this report, the GIS Steering Committee is awaiting final approval of that USGS funding. It is expected that such a study will address many of the issues related to the development of a statewide PLSS database, model interlocal agreements, and the regional professional service centers, as outlined in the 2000 Strategic Plan.

The Steering Committee continues to support education and outreach efforts directed toward local government officials through projects such as biennial GIS Symposiums, presentations at Nebraska Association of County Officials and League of Nebraska Municipalities meetings, and the development and distribution of the Guidebook for Local Government Multipurpose Land Information Systems. However, a more focused and comprehensive effort in this regard is beyond the current resources available to the Steering Committee.

Where We Are Going. One of the biggest hurdles to statewide land record modernization is the lack of a consensus approach for how local, regional, state, and federal agencies can best cooperate to support efforts to develop and maintain modern land record systems. It is hoped that the proposed Nebraska Land Record Modernization Study will provide a basis for moving all of the key parties several steps forward toward achieving and implementing such a consensus approach. It is the current understanding that this study will be underwritten by USGS funding. If this funding ultimately does not materialize, the GIS Steering Committee will need to reassess how the policy/structural questions related to land record modernization can be best addressed.

TECHNICAL ASSISTANCE. *Provide technical assistance to local governments and state agencies.*

Why it is a Priority. With the growing interest in GIS, the technology is no longer just being used by a limited number of fairly large public agencies. It is becoming a powerful mainstream information technology, with a wide variety of state and local level agencies either developing or having an interest in developing GIS applications. With this growing interest in the technology, there is a parallel growing need for technical assistance to help these agencies develop their GIS/geospatial data or applications. These technical assistance needs range from guidance in designing and planning the development of an in-house capability; to specialized GIS application development; to large-scale geospatial data development projects; to on-going development and maintenance of specific GIS applications.

Up to this point, the primary operational model in Nebraska has been for each agency or local government to develop and maintain its own in-house GIS capability. This has worked fairly well in that most of the early adopter agencies already had technical personnel on board and had a fairly wide range of GIS/geospatial applications they wanted to develop. With more and more agencies expressing interest in the technology, it is time to consider the merits and efficiencies that might be gained by arrangements to aggregate the demand and resources available to support these technical services. The need for this pooling of demand and resources is particularly apparent in the rural and non-urban areas of Nebraska, where individual local governments or agencies frequently lack the resources to support the technical services they need to adequately fulfill their responsibilities. At the state government level, it is a question of the optimum use of public resources. Should each new agency interested in utilizing GIS technology develop its own in-house capabilities or should other models be explored for how best to meet this growing interest in the technology. In the 2000 Strategic Plan, the GIS Steering Committee outlined two conceptual models which it felt should be explored as possible approaches for addressing the growing need for GIS technical assistance**.**

- **Regional Professional Service Centers.** Explore the support for and feasibility of developing regional professional service centers to assist local governments and other public entities to aggregate and provide for their surveying, mapping, GIS, and other possible professional service needs.
- **GIS Service Bureau.** Work with the Executive and Legislative Branches of state government to explore the need and support for designating and providing base funding for a GIS service bureau for state government. The service bureau's mission would be to provide (upon their request) state/local agencies with assistance in the development and analysis of geospatial data, the development of GIS applications, and to provide operational support for implementing the GIS Steering Committee's coordinated development priorities.

Current Status. The recent dramatic events of September 11th have served to highlight the need for increased GIS-related technical assistance and data sharing among government agencies. The desire to quickly develop and maintain a GIS capability for emergency planning and response has illustrated both the short-term needs and the long-term necessity for both enhanced technical assistance and data sharing capabilities.

One of the most rapidly growing technological trends in GIS is the use of the Internet as a means to interactively access, display, and analyze geospatial data. At its May 2001 meeting, the GIS Steering Committee authorized the formation of an Advisory Committee on Interactive Internet Mapping with the charge to make recommendations related to standards and guidelines for

internet access to GIS data and attributes from potentially multiple sources, including the use of interactive mapping technologies. This Advisory Committee has provided a means for agencies to learn from each other as they explore this new technology. The Advisory Committee has developed some initial recommendations for standards and guidelines to facilitate sharing data via this internet mapping technology and those recommendations were endorsed by the GIS Steering Committee at its November 2001 meeting (see Appendix). The Advisory Committee also recommended that consideration should be given to the establishment of a spatial data access and support center.

> *A State of Nebraska spatial data access and support center (GIS portal) should be established to facilitate efficient access to and sharing of Nebraska-related geospatial data and to provide appropriate technical support to assist the multiple users of this data in state, local, and federal agencies, the private sector and the general public.*

Partially in response to this recommendation, the Steering Committee authorized the formation of a new Advisory Committee on Facilitating Geospatial Data Sharing at its November 2001 meeting. This new Advisory Committee was also a response to the earlier recommendations included the 2000 Strategic Plan, which called for exploring the possibility of establishing a GIS Service Bureau and for enhancing the existing Nebraska Geospatial Data Clearinghouse. This new Advisory Committee is discussed in more detail under the Data Sharing and Distribution Initiative in this report.

As was discussion earlier in this report, under the Land Record Modernization Initiative, the GIS Steering Committee has also worked with several public agencies to outline a project charter for a Land Record Modernization Study. It is hoped that this study will explore most of the issues involved in the potential development of regional professional service centers, or other entities designed to help meet the technical assistance needs of local governemnts.

Where We Are Going. Most of the key issues and concerns involved in enhancing the technical assistance available to local governments and state agencies are related more to intergovernmental public policy and structural issues than they are to technical issues. It is hoped that efforts such as the new Advisory Committee on Facilitating Geospatial Data Sharing and the proposed Land Record Modernization Study will provide processes that will help clarify the needs and issues involved and develop proposals to address these needs which will have a relatively high degree of consensus among the key constituencies.

EDUCATION/OUTREACH. *Promote an educational outreach program designed to maximize the overall return on public investments in the development of geographically referenced databases and GIS systems by providing educational materials, presentations and coordination services to the public officials and technical staff who will be making these investment decisions.*

Why it is a Priority. While GIS can no longer be considered a new technology, it is still new and relatively complex for many of the agencies and policy makers who are now considering their initial public investments in the technology. Without education and/or technical assistance these public sector decision-makers can easily make costly mistakes in their initial GIS investment decisions. The risks of costly mistakes have less to do with the hardware and software, and more with data purchase or development decisions. This need is particularly acute in relation to local governments. Local governments make substantial investments in mapping and aerial photography in the course of fulfilling their areas of responsibility. For many county

commissioners, county assessors, and agency directors these are new areas of expertise. Public investments in a GIS educational/outreach program, directed toward government decision-makers, would increase the probability of wise public investment decisions in GIS technology and data. Such an education program would increase the likelihood that costly geospatial databases developed for one area and application, would not only work as intended for that application, but also for other areas and applications. Such an education/outreach program is a vital component of a coordinated GIS development effort.

The 2000 Strategic Plan outlined, under this initiative, three proposed projects or objectives:

- Guidebook for Local Government Land Record Modernization. The development of a set of guidelines and background education material to assist local government in the modernization of their land records and the development of a multipurpose local GIS.

- GIS Education/Outreach Program. Conduct an educational outreach program designed to maximize the overall return on local government investments in the development of geographically referenced databases and GIS systems by providing educational materials, presentations and coordination services to the public officials who will be making these investment decisions.

- Nebraska GIS Symposium. Actively support efforts by the Nebraska GIS/LIS Association to organize a biennial Nebraska GIS Symposium to provide the broad range, intensive educational opportunity to the growing Nebraska GIS community.

Current Status. The GIS Steering Committee has attempted to address these GIS-related outreach, education and coordination needs. However, its efforts have, of necessity, been limited because of the lack of program resources. The GIS Steering Committee works cooperative with the non-profit Nebraska GIS/LIS Association to facilitate communication/coordination within the growing GIS community by helping to publish a regular Nebraska GIS Update Newsletter and by co-sponsoring a community-wide email list server. Over the last several years, the Steering Committee has regularly staffed an educational booth at the Nebraska Association of County Officials (NACO) Annual Conference and has provided other presentations as the opportunity and resources allow. The Multipurpose Land Information System Guidebook project, outlined under the Land Records Modernization initiative, is focused on developing guidelines to assist local government officials to make wise public investments in GIS technology.

In May 2001, the GIS Steering Committee worked with the 2001 Nebraska GIS/LIS Association to organize and host the Nebraska GIS Symposium at the Cornhusker Hotel in Lincoln. This event ran for 3-1/2 days, was attended by over 300 participants, and included 19 short courses and 17 concurrent sessions. In addition to the Steering Committee and the GIS/LIS Association, 18 other public and private organizations joined in co-sponsoring this biennial event.

Where We Are Going. The GIS Steering Committee will continue to work with groups like the Nebraska GIS/LIS Association, NACO and the League of Nebraska Municipalities to encourage and provide GIS-related education and outreach programs. Unless additional resources are made available, all of these efforts will be severely handicapped by the lack of program resources.

DATA SHARING AND DISTRIBUTION. *Develop structures, standards, and processes that facilitate easy access to, integration, and usability of publicly available geospatial data.*

Why it is a Priority. A key component of any coordinated GIS development strategy must be the development and maintenance of mechanisms to facilitate the sharing of widely needed geospatial data. In the aftermath of the September 11th terrorist attack, the importance of reliable, efficient mechanisms for geospatial data sharing have become very evident. In times of an emergency, responders need quick access to the most accurate and current data available, and in data formats that can be quickly and easily integrated.

There are several essential elements to such a data sharing strategy. These include the easy ability to discover the existence of data and how it may be accessed. Most GIS experts would suggest that 70 to 80% of GIS implementation costs are commonly related to geospatial data development or acquisition. One of the surest ways to reduce the level of investment required for geospatial data development is to locate existing geospatial datasets, developed by someone else, that will meet some or all of your data needs. Geospatial data clearinghouses are a key component of the evolving spatial data infrastructure. Data clearinghouses are intended to provide a systematic approach for cataloging and locating available geospatial data for a particular area or region.

The documentation of the data to facilitate its proper use is another essential element of facilitating data sharing. If someone gets a geospatial dataset from someone else it is difficult to determine the appropriate use of that data if it is not documented with metadata (data about the data). Likewise, when there is a substantial public investment in the development of a database, the parallel development of metadata is important to preserve the public investment in that data. Without adequate metadata documentation, when the key staff members, who originally developed a given database, leave the organization, it is sometimes difficult to justify continuing to use that database. Without adequate documentation to explain how database figures or coding were derived it is difficult to defend policy or regulatory decisions based on that data. Standardized metadata also provides the basis for potential users to find available geospatial data through geospatial database search tools that have been developed around metadata standards.

The 2000 GIS Strategic Plan outlined the following as potential foci or projects under this Data Sharing and Distribution Initiative:

- Metadata Development. Initiate an on-going, active program to encourage and assist public agencies to document their geospatial databases with standardized metadata. Metadata program would include policy formation, outreach, periodic workshops, and technical assistance in creating metadata.

- Geospatial Data Clearinghouse. Integrate and build upon existing agency geospatial data Internet listings and clearinghouses to develop a high-profile clearinghouse for locating and accessing Nebraska-related geospatial data.

- Geospatial Data Sharing Cooperative. Promote and facilitate geospatial data sharing among public agencies through development of a Nebraska Geospatial Data Sharing Cooperative based on a common data sharing agreement.

Current Status. The Nebraska GIS Steering Committee has long recognized that facilitating data sharing and distribution must be one of its priority goals. Nebraska currently has two

geospatial data clearinghouses, neither of which are comprehensive in nature. One is maintained by NDNR and is used to catalog geospatial data maintained by the NDNR Databank. The other, the Nebraska Geospatial Clearinghouse, is hosted by Nebraska Online on behalf of the Nebraska GIS Steering Committee. While this clearinghouse does provide a catalog of several key statewide geospatial databases, there are numerous other databases currently available, but have not been documented nor cataloged. The 2000 Strategic Plan noted that the Steering Committee does not currently have the resources that are needed to maintain a comprehensive geospatial clearinghouse for Nebraska.

The importance of this data sharing goal has recently received increased focus as a result of a couple of national initiatives. In the aftermath of the September 11th terrorist attack, the Steering Committee's Coordinator and member agencies worked closely with the Nebraska Emergency Management Agency to identify and locate the best available geospatial database for emergency and threat assessment planning.

In addition to the Homeland Security initiatives, there was also an earlier national initiative originating from a joint effort by the Federal Geographic Data Committee (FGDC) and the US Office of Management and the Budget (OMB). This initiative, known as Implementation-Teams (I-Teams), focused on a combined federal, state, local and private effort to identify widely needed geospatial datasets, assess their current status and availability, and to develop cooperative plans for their development, maintenance and distribution. While the I-Team concept was initiated at the federal level, all parties involved recognized the key role that state coordinating bodies such as the Nebraska GIS Steering Committee must play for it to be successful. Additional information on the Nebraska I-Team activities is provided under the Strengthen Coordination Capacity Initiative that immediately follows.

One of the fastest growing areas of GIS technology development relates to the use of the Internet as a means to access, display and analyze geospatial data remotely. At its May 2001 meeting the Nebraska GIS Steering Committee authorized the creation of an Advisory Committee on Interactive Internet Mapping *(see Appendix*). This Advisory Committee has developed several recommendations designed to facilitate data sharing using interactive Internet map servers. Additional information regarding this effort was provided under the earlier discussion of the Technical Assistance Initiative. This Internet Mapping Advisory Committee also recommended the establishment of a "*Nebraska spatial data access and support center (GIS portal)¼ to facilitate efficient access to and sharing of Nebraska-related geospatial data¼ "*.

Partially in response to this recommendation, the Steering Committee authorized the formation of a new Advisory Committee on Facilitating Geospatial Data Sharing at its November 2001 meeting *(see Appendix*). This new Advisory Committee was also a response to the earlier recommendations included the 2000 Strategic Plan, which called for exploring the possibility of establishing a GIS Service Bureau and for enhancing the existing Nebraska Geospatial Data Clearinghouse. This new Advisory Committee is charged with making "*recommendations related to the structures, standards, and processes that should be developed to facilitate easy access to, integration, and usability of publicly available Nebraska-related geospatial data,¼ with a particular focus on the related policy and funding issues."*

Where We Are Going. As more and more public and private entities adopt GIS technology, the importance and complexity of facilitating geospatial data sharing is growing rapidly. National initiatives such as the Homeland Security and I-Teams have added to the challenge by

adding the necessity of thoroughly integrating federal agencies and their needs into the mix. Everyone involved realizes the tremendous savings that can be achieved through joint data development and data sharing. However, it will require resources to develop and maintain the means to document, catalog, and distribute, on an on-going basis, a wide variety of geospatial data coming from a variety of state, local, federal agencies and private entities.

Currently there is no agency within Nebraska state government which is charged with filling these general geospatial data sharing needs. If the current trends are any indicators of future needs, the needs in the area of geospatial data sharing are likely to continue to grow at a fairly rapid pace. The GIS Steering Committee has charged its newly authorized Advisory Committee on Facilitating Geospatial Data Sharing with exploring this range of issues and making recommendations for how we might best develop and maintain this key piece of our data infrastructure.

STRENGTHEN COORDINATION CAPACITY. *Strengthen the GIS Steering Committee's operational capability to facilitate the implementation of priority geospatial database development decisions, data sharing, interagency/intergovernmental partnerships, and agencies' utilization of GIS technology.*

Why it is a Priority. While Nebraska statutes define broad areas of responsibilities for the Nebraska GIS Steering Committee, the Committee has very little in the way of independent authority and/or resources to seriously address those responsibilities. With limited authority and no operational capability or budget, Steering Committee decisions and priorities can only be implemented through the sponsorship and active support of independent state, local or federal agencies. The coordination of GIS development for the overall good of the broad and growing Nebraska GIS user community is a unique and challenging mission not specifically shared by any other public entity. In some specific instances other agencies' missions and priorities are congruent with those of the Steering Committee and in those cases those agencies may take the lead on a project on behalf of the Steering Committee. However, where this parallel sense of priorities does not exist, the Steering Committee is seriously limited in its ability to implement its priorities.

GIS and geospatial data are key information technology tools that are becoming integrated into the way many public agencies fulfill their missions. Core framework geospatial datasets are vital components of our shared information technology infrastructure. Higher long-term public costs will be the result, if we do not put in place effective mechanisms to develop and maintain common, shared versions of these key pieces of our shared data infrastructure.

Many of today's major geospatial data development efforts are only feasible through intergovernmental partnerships. The Steering Committee's structure is poorly suited to facilitating the actual implementation of those partnership projects. The 2000 GIS Strategic Plan noted that the availability of seed funding specifically dedicated to collaborative GIS development efforts and the ready access to institutional channels, whereby the resources from intergovernmental partners could be efficiently combined and leveraged, would enhance the Steering Committee's ability to implement collaborative GIS development projects.

The 2000 GIS Strategic Plan outlined four projects or initiatives that would potentially help to strengthen the overall coordination capacity of the GIS Steering Committee.

- GIS Service Bureau. Explore the need and support for designating and providing base funding for a GIS service bureau for state government. The service bureau's mission would be to provide (upon their request) state/local agencies with assistance in the development and analysis of geospatial data, the development of GIS applications, and to provide operational support for implementing the GIS Steering Committee's coordinated development priorities.

- GIS Education/Outreach Program. Conduct an educational outreach program designed to maximize the overall return on local government investments in the development of geographically referenced databases and GIS systems by providing educational materials, presentations and coordination services to the public officials who will be making these investment decisions.

- Geospatial Data Clearinghouse. Integrate and build upon existing agency geospatial data Internet listings and clearinghouses to develop a high-profile clearinghouse for locating and accessing Nebraska-related geospatial data.

- Collaborative Database Development Fund. Work with the Executive and Legislative Branches of state government to establish and fund a Collaborative Geospatial Database Development Fund dedicated to facilitating collaborative, interagency-intergovernmental partnerships focused on the development of priority database development efforts.

Current Status. Efforts related to three of the four projects or initiatives highlighted above have been addressed previously in this report, specifically: the GIS Service Bureau, under the Technical Assistance Initiative; the GIS Education/Outreach Program, under the Education and Outreach Initiative: and the Geospatial Data Clearinghouse, under the Data Sharing and Distribution Initiative.

During 2001, the GIS Steering Committee accepted the invitation for the Federal Geographic Data Committee (FGDC) and the US Office of Management and Budget (OMB) to take the lead in initiating a formalized I-Team (federal, state, local and private) planning effort for Nebraska-related geospatial data and the broader National Spatial Data Infrastructure (NSDI) infrastructure. As an initial step in this integrated planning process, the GIS Steering Committee organized a September 5th meeting of representatives of federal agencies who use Nebraska-related geospatial data. At that meeting, eighteen federal agencies gave brief presentations on their use and development of geospatial data. All agency representatives expressed an interest in further coordination. Current plans call for convening semi-annual meetings of interested participants from federal, state, local and private entities to further explore and develop collaborative NSDI projects.

The 2000 GIS Strategic Plan noted that the availability of seed funding specifically dedicated to collaborative GIS development efforts and the ready access to institutional channels whereby the resources from intergovernmental partners could be efficiently combined and leveraged would enhance the Steering Committee's ability implement collaborative GIS development projects. Efforts in 2001 to facilitate the intergovernmental project to develop a statewide, surface water database illustrate the continuing need for this funding and these institutional mechanisms.

Based on a pilot project in one Nebraska watershed (Logan Creek), several state, local and federal agencies expressed support for the development of a standardized, high-resolution, hydrographic dataset for Nebraska. At the same time, none of these interested agencies felt that

it was clearly within their agency's mandate and available resources to undertake such a large scale data development effort themselves. Based on the pilot project experience, it was estimated that by working in-house, and using college student labor, that such a database might be created on a statewide basis for approximately $2 million dollars.

The potential availability of grants through the Nebraska Information Technology Commission (NITC) proved to be a catalyst for moving this intergovernmental project forward. The GIS Steering Committee worked closely with the Lower Platte North NRD to apply for a $24,800 grant for the NITC's Community Technology Fund 2001 to develop this hydrography database for the Salt Creek watershed. This data development project is currently underway and was made possible because of these grant funds and the substantial in-kind contributions from the other project partners — NDNR and CSD-UNL.

A closely related follow-up project was stimulated by the potential availability of funding from another, later NITC grant letting. The GIS Steering Committee also worked closely with the NDNR to apply for a $25,000 grant from the NITC's Government Technology Collaboration Fund–2001. This grant was approved and together with in-kind contributions from Nebraska Department of Natural Resources, Conservation and Survey Division-UNL, and financial contributions from the Nebraska Department of Environmental Quality, the Nebraska Department of Roads, and the Lower Elkhorn NRD, this hydrography dataset will also be developed for the Lower Elkhorn watershed.

Where We Are Going. The process of securing the two grants outlined above illustrate both the need for and the value of seed funding as a stimulus for pooling other resources in intergovernmental geospatial data development efforts. These two projects also serve to illustrate some of the weakness or problems with the currently available funding mechanisms as they relate to intergovernmental geospatial development efforts.

The organization of both grant efforts required the expenditure of a large amount of resources in area of administrative overhead from several agencies, for what ultimately was a relatively small amount of funding compared to the overall statewide project need. If it is necessary to continue this process, seeking grant funding watershed-by-watershed, all across Nebraska, a tremendous amount of administrative overhead resources will be expended.

The relatively small amount of funding available for each grant cycle also makes it very difficult to gear up a production process that might gain significant benefits from economies of scale. The relatively small amount of annual funding also means that this intergovernmental effort might have to be sustained for 35 years to the develop this standardized hydrography dataset for the approximately 70 watersheds in Nebraska, versus making a major commitment and gearing up to accomplish the task in 4-5 years.

These grant processes also raised questions as to whether it is realistic to continue to stimulate intergovernmental funding for a statewide effort using these funding sources. While the grant from the NITC Community Technology Fund was ultimately approved, there was a fairly clear message sent that the priorities for that fund were perceived by the NITC Community Council to be elsewhere. Given most people's desire to be "innovative", one must also question whether the NITC Government Council is likely to be open to helping to fund this effort from the Government Technology Collaboration Fund on a watershed-by-watershed effort, year after year.

In summary, while these two NITC funds have been very helpful in stimulating interagency, intergovernmental funding and have helped to move this hydrographic dataset development effort forward, they offer many challenges and problems as a source of on-going seed funding for this type of database development effort.

The Implementation-Team (I-Team) state, federal, and local planning efforts re-enforce the collaborative planning model that has been the GIS Steering Committee's approach since its creation. The formalization of the I-Team concept and several other national GIS coordination initiatives serve to illustrate the growing demands for state level GIS/geospatial data coordination.

APPENDIX

ARTICLE 26
GEOGRAPHIC INFORMATION SYSTEM

Section.
81-2601. Legislature; Intergovernmental Data Communications Advisory Council; findings
81-2602. Geographic Information System Steering Committee; created; members; appointment; terms; expenses.
81-2603. Committee; officers; advisory committees; meetings.
81-2604. Committee; duties.
81-2605. Committee; report.

81-2601. Legislature; Intergovernmental Data Communications Advisory Council; findings. The Legislature finds that the Geographic Information System is a computer-based technology that captures, stores, analyzes, and displays information about the earth's surface from a geographically referenced system, that an interest in the system is rapidly increasing at all levels of government, and that an institutional mechanism is needed to encourage initiatives, coordinate efforts, avoid duplication, seek efficiencies, develop guidelines, policies, and standards for operations and management, promote education and training, and make recommendations so that such technology will benefit the entire state and endure as an analysis tool for decision makers.

The Intergovernmental Data Communications Advisory Council has found that there are many levels of experience, expertise, and hardware and software sophistication among the various levels of government and that guidelines, policies, coordination, and standards are required to realize the maximum benefits of this technology, avoid data quality problems., and resolve conflicts at a reasonable cost for the state.

It is the intent of the Legislature that a Geographic Information System Steering Committee be created with statewide responsibilities to take an active role in implementing the Geographic Information System. Such committee would help facilitate acquisition of such technology at all levels of government and make recommendations to the Legislature for program initiatives and funding and the fostering of communications, training, and education.

81-2602. Geographic Information System Steering Committee; created; members; appointment; terms; expenses. The Geographic Information System Steering Committee is hereby created and shall consist of eighteen members as follows:

(1) The director or designee of the Department of Administrative Services, the Department of Environmental Control, The Conservation and Survey Division of the University of Nebraska, the Nebraska Natural Resources Commission, and the Governor's Policy Research Office;

(2) The Director-State Engineer or designee;

(3) The State Surveyor or designee;

(4) The Clerk of the Legislature or designee;

(5) The secretary of the Game and Parks Commission or designee;

(6) The Property Tax Administrator or designee;

(7) One representative of federal agencies appointed by the Governor;

(8) One representative of the natural resources districts nominated by the Nebraska Association of Resources Districts and appointed by the Governor;

(9) One representative of the public power districts appointed by the Governor;

(10) Two representatives of the counties nominated by the Nebraska Association of County Officials and appointed by the Governor;

(11) One representative of the municipalities nominated by the League of Nebraska Municipalities and appointed by the Governor; and

(12) Two members at large appointed by the Governor.

The appointed members shall serve for terms of four years, except that of the initial members appointed by the Governor, one of the representatives of the counties shall be appointed for one year and the other shall be appointed for three years, one of the members at large shall be appointed for one year and the other for three years, and the representative of the public power districts shall be appointed for two years. Their successors shall be appointed for four-year terms. Any vacancy on the committee shall be filled in the same manner as the original appointment, and the person selected to fill such vacancy shall have the same qualifications as the member whose vacancy is being filled.

The members shall be reimbursed for their actual and necessary expenses as provided in sections 81-1174 to 81-1177.

81-2603. Committee; officers; advisory committees; meetings. The Geographic Information System Steering Committee shall elect a chairperson from its membership and such other officers as the committee deems necessary. As the need arises, advisory committees may be established by the committee from various levels of government, industry, or the general public to assist the committee.

The committee shall meet quarterly or upon the call of the chairperson.

81-2604. Committee; duties. The Geographic Information System Steering Committee shall:

(1) Make recommendations to the Legislature for program initiatives and funding;

(2) Establish guidelines and policies for statewide Geographic Information System operations and management to include:

(a) The acquisition, development, maintenance, quality assurance such as quality control standards, access, ownership, cost recovery, and priorities of data bases;

(b) The compatibility, acquisition, and communications of hardware and software;

(c) The assessment of needs, identification of scope, setting of standards, and determination of an appropriate enforcement mechanism;

(d) The fostering of training programs and promoting education and information about the Geographic Information System; and

(e) The promoting of the Geographic Information System development in the State of Nebraska and providing or coordinating additional support to address Geographic Information System issues as such issues arise;

(3) Report to, assist, and advise the Chief Information Officer in setting information technology policy; and

(4) Provide assistance as requested by the Nebraska Information Technology Commission to support the technical panel created in section 11 of this act.

81-2605. Committee; report. Annually, the chairperson of the Geographic Information System Steering Committee shall submit a written report, approved by the committee, to the Governor and the Clerk of the Legislature and shall send a copy of such report to the Intergovernmental Data Communications Advisory Council.

NEBRASKA GIS STEERING COMMITTEE

as of December 2001

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Nebraska GIS Steering Committee

Resolution Creating an Advisory Committee on Interactive Internet Mapping

passed on 5/10/01

Whereas: Geographic Information Systems (GIS) technology provide powerful tools for displaying, mapping and analyzing a wide variety of locationally-referenced information which state and local governments collect and use to develop and implement public policies and to communicate with the general public;

Whereas: The Internet is a widely accepted and powerful tool for sharing information and for facilitating decentralized information technology applications;

Whereas: Recent advances in the development of Internet-based GIS software offers the promise of combining the versatility and power of these two technologies;

Whereas: A significant public investment in GIS-related data, hardware, software, network communications and technical support will be required for many public agencies to take advantage of the synergy of these two technologies;

Whereas: The Nebraska GIS Steering Committee is charged with establishing guidelines and policies for statewide Geographic Information Systems and authorized to establish advisory committees from various levels of government, industry, or the general public pursuant to Sections 81-2604 and 81-2603, R.R.S. 1943; and

Whereas: The Technical Panel of the Nebraska Information Technology Commission has requested that the Nebraska GIS Steering Committee make recommendations for standards and guidelines for internet access to GIS data and attributes from multiple sources, including the use of interactive mapping technologies.

Now Therefore, be it resolved:

Section 1. That the Nebraska GIS Steering Committee creates an Advisory Committee on Interactive Internet Mapping to make recommendations related to standards and guidelines for internet access to GIS data and attributes from potentially multiple sources, including the use of interactive mapping technologies.

Section 2. In its review of interactive Internet GIS mapping, the Advisory Committee shall consider both technical and policy issues and make recommendations to the Nebraska GIS Steering Committee that will facilitate intergovernmental collaboration and the efficient utilization of this emerging technology.

Section 5. In developing these recommendations, the Advisory Committee shall consider the likely needs of state and local agencies that currently have GIS capabilities, and those that currently have little or no GIS capabilities, but may wish to apply the power of interactive Internet mapping in their future work.

Section 4. Among the issues the Advisory Committee should consider in making its recommendations are the following:

a) the implications of different map projections, datums and scales;

b) the implications of different vendor specific database formats and/or software;

c) the implications of data and network security concerns;

e) the ability to create an integrated presentation of data that reside on separate systems; and

d) the need for, and cost/benefit of, developing collaborative mechanisms such as a shared geospatial data repository to facilitate common data access, shared server and software, and/or shared technical support.

Section 5. The Advisory Committee's existence commences when this resolution is passed and concludes one year later. The GIS Steering Committee may extend the duration of the Advisory Committee.

Interactive Internet Mapping Advisory Committee Recommendations

Standards/Guidelines Recommendations: (*Adopted by Nebr. GIS Steering Committee on 11/2/01)*
To facilitate efficient online geospatial data sharing and to minimize geospatial analytical errors:

- Public agencies developing and/or maintaining geospatial datasets which will be shared with other entities for use in geospatial applications, should make new datasets, developed after January 1, 2002, available in the Nebraska State Plane Coordinate System (State Plane Coordinate System, NAD83, Zone 2600, US Survey Foot or Meter).
- To preserve the public's investment in geospatial databases and to facilitate data sharing, public agencies should document new geospatial data it collects or produces, either directly or indirectly, with metadata compliant with the Federal Geographic Data Committee (FGDC) Content Standards for Digital Geospatial Metadata (data describing the data). Systematic efforts should also be made to develop metadata for existing legacy geospatial data, as time and resources allow. *(adopted by the Nebraska GIS Steering Committee on 3/9/00)*
- Public agencies should provide easy online access to metadata documentation for each geospatial dataset made available online. This metadata documentation should be compliant with the Federal Geographic Data Committee (FGDC) Content Standards for Digital Geospatial Metadata.
- Public agencies using geospatial data from another agency in their Internet mapping applications, should provide a citation of data sources.
- Public agencies using interactive internet mapping technologies should include a disclaimer statement alerting the users of the potential limitations of the data/map displayed. A sample disclaimer template is provided below.

  Disclaimer Template. The information displayed on this map is furnished as a public service by the [agency name] Geographic Information System (GIS). Data contained in the [agency name] GIS is composed of various public information sources and is intended to be used as a reference only. The [agency name] make no warranties either expressed or implied, concerning the accuracy, completeness, reliability, or suitability of this data for any use other than display. Furthermore, the [agency name] assumes no liability for the use or misuse of the information contained in this map. Please contact the [agency name] if you discover any discrepancies on this document.

Structural Recommendation: *(presented to Nebr. GIS Steering Committee on 11/1/01, provided a basis for the authorization of an Advisory Committee on Facilitating Data Sharing, see page 44)*

A State of Nebraska spatial data access and support center *(GIS portal)* should be established to facilitate efficient access to and sharing of Nebraska-related geospatial data and to provide appropriate technical support to assist the multiple users of this data in state, local, and federal agencies, the private sector and the general public.

Potential role(s) of a Nebraska spatial data access and support center: *(a range of related service options, some of which could be initially incorporated into such a center, others potentially developed later as policy makers deem appropriate and resources become available, and some possibly not at all)*

a. Maintain a central geospatial clearinghouse with catalog search engines to identify the wide range of Nebraska-related geospatial data that is currently available, standardized documentation on the specific databases, and information on how the data might be accessed.
b. Maintain a central repository and online access point for a broad cross-section of Nebraska-related geospatial databases, either by direct download, links through interactive Internet map server technology, or a variety of offline digital transfer media.
c. Provide users with a single contact point to obtain the most recent versions of a variety of dynamic geospatial databases and the agencies responsible for maintaining these dynamic geospatial databases with a single point of contact with these data users.
d. Free up personnel in data producing agencies from responding to common day-to-day questions and requests related to geospatial databases by fielding many of these inquiries at the data access and support center level.
e. Provide agencies wishing to develop and maintain their own internal Internet mapping capabilities with a convenient one-stop online interactive access point for widely-used (particularly large and/or dynamic) data files, to allow them to access these files through their internet map services, without requiring them to maintain separate copies of these large and/or dynamic files on their internal agency servers.
f. Provide a variety of state and local agencies with capability of distributing information using interactive Internet mapping service technologies without the necessity of acquiring the specialized hardware and software, and developing and maintaining the specialized technical expertise.
g. Offer the potential of a one-stop GIS portal for accessing state data via Internet mapping services.
h. Assist a variety of agencies to explore the potential of, and develop and maintain a range of interactive Internet mapping applications in support of their agency missions by providing a convenient and knowledge service center.
i. Provide state and local public agencies with outreach and education related to GIS implementation.

Resolution Creating an Advisory Committee on Facilitating Geospatial Data Sharing

Adopted 11/1/01

Whereas: Current and accurate geospatial data is a necessary component of Geographic Information Systems (GIS), and in most cases the most expensive component;

Whereas: Facilitating geospatial data sharing is widely recognized as one of the most cost-effective strategies for reducing overall GIS implementation costs, and for helping to produce consistent and compatible public policy results across agencies and levels of government based on the shared use of the most current and accurate geospatial data available;

Whereas: The Nebraska GIS Steering Committee has recognized that facilitating data sharing and distribution is a priority long-term goal and in its September 2000 Strategic Plan endorsed an initiative to "Develop structures, standards, and processes that facilitate easy access to, integration, and usability of publicly available geospatial data";

Whereas: The Nebraska GIS Steering Committee recognized the critical role of geospatial data clearinghouses in facilitating data sharing and noted in its September 2000 Strategic Plan some of the problems and weaknesses of the current Nebraska clearinghouse system and called for convening a subcommittee to make recommendations for enhancing Nebraska geospatial data clearinghouse capabilities;

Whereas: The Nebraska GIS Steering Committee's Advisory Committee on Interactive Internet Mapping has recommended, "A State of Nebraska spatial data access and support center should be established to facilitate efficient access to and sharing of Nebraska-related geospatial data and to provide appropriate technical support to assist the multiple users of this data in state, local, and federal agencies, the private sector and the general public"; and

Whereas: The Nebraska GIS Steering Committee, is charged with making recommendations to the Legislature for program initiatives and funding, with establishing guidelines and policies for statewide Geographic Information Systems, and is authorized to establish advisory committees from various levels of government, industry, or the general public pursuant to Sections 81-2604 and 81-2603, R.R.S. 1943.

Now Therefore, be it resolved:

Section 1. That the Nebraska GIS Steering Committee creates an Advisory Committee on Facilitating Geospatial Data Sharing to make recommendations related to the structures, standards, and processes that should be developed to facilitate easy access to, integration, and usability of publicly available Nebraska-related geospatial data.

Section 2. In its review of what is needed to enhance geospatial data sharing, the Advisory Committee shall focus primarily on the related policy and funding issues and make recommendations to the Nebraska GIS Steering Committee which will promote the most cost-effective means to enable the broadest use and highest return on overall public investments in the geospatial data infrastructure and facilitate sound public policy decision making by enabling the efficient, shared use of the best available geospatial data.

Section 5. In developing these recommendations, the Advisory Committee shall consider both the likely needs of state, local and federal agencies and private entities that currently have GIS capabilities, as well as those that currently have little or no GIS capabilities, but may wish to apply the power of GIS technology in their future work.

Section 4. Pursuant to the intent outlined in the GIS Steering Committee's Data Sharing and Distribution Goal, this Advisory Committee is charged with reporting to the Steering Committee on the following areas:

a) an assessment of the strengths and weaknesses of the current Nebraska geospatial data clearinghouse arrangements;
b) an assessment of the likely future needs for, and benefits of, an enhanced Nebraska geospatial data clearinghouse and/or a more comprehensive geospatial data access and support center, and the likelihood of support for an enhanced clearinghouse/data center by major GIS user agencies;
c) recommendations outlining the clearinghouse/data center structure(s) and processes that should be developed to efficiently address current and future geospatial data sharing and distribution needs, including:
    1. range of services that a clearinghouse/data center should provide, both initially and in later stages of development,
    2. estimated costs of providing the various levels of service,
    3. optimal institutional setting(s) and structure of future clearinghouse/data center,
    4. alternative methods of funding clearinghouse/data center,
    5. relationship of clearinghouse/data center to GIS Steering Committee and other information technology coordinating entities, and
    6. relationship of clearinghouse/data center to other existing data distribution/clearinghouse centers.

Section 5. The Advisory Committee's existence commences when this resolution is passed and concludes one year later. The GIS Steering Committee may extend the duration of the Advisory Committee.